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OCTOBER 2015 • ISSUE 457

The maple tree MENACE

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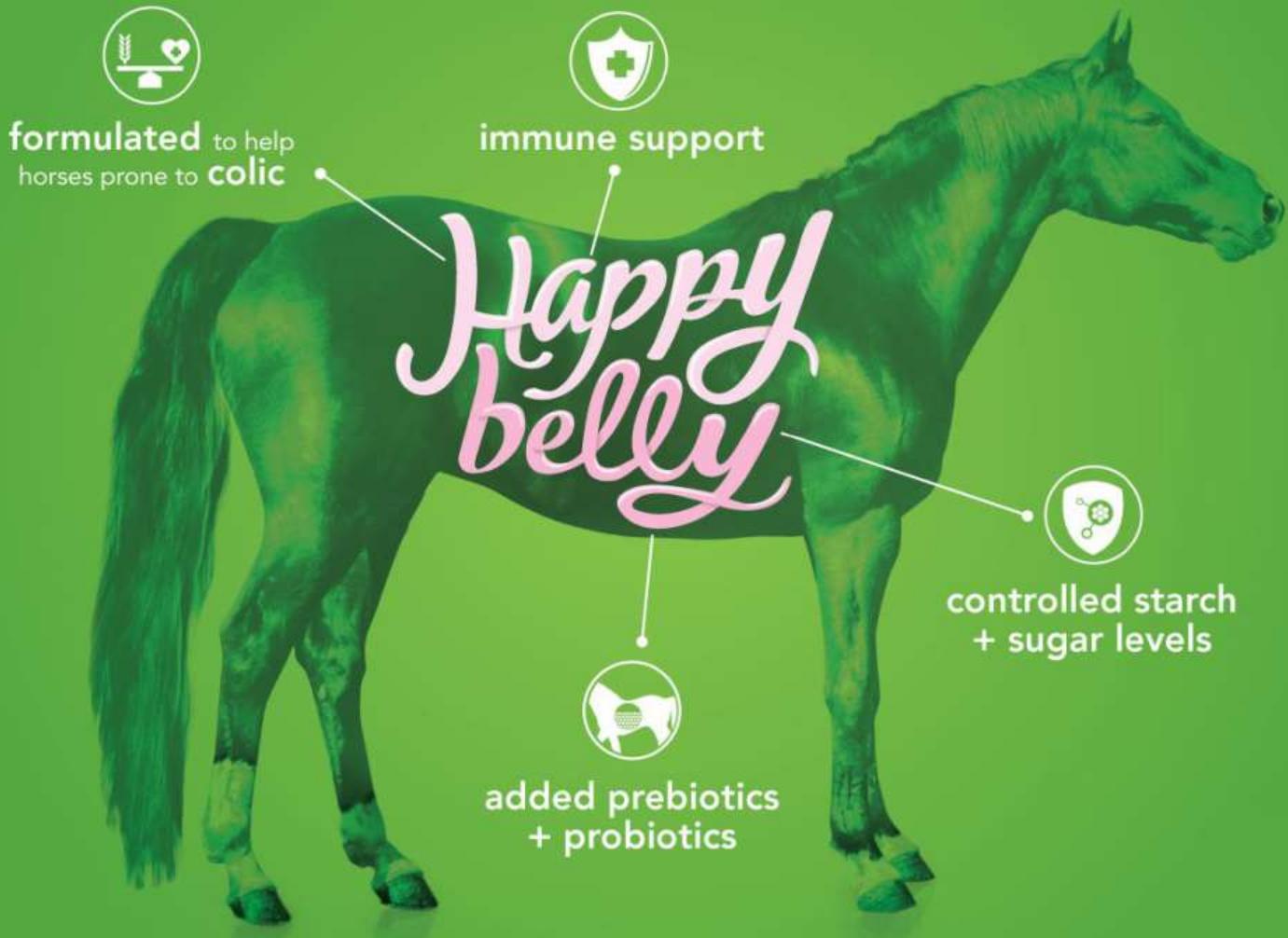


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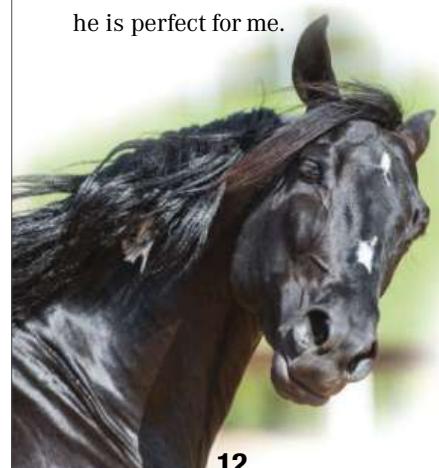
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	Vitamin E	500 IU	250 IU	620 IU	1000 mg	100 IU	5000 mg
	Vitamin A	22500 IU	11500 IU	5000 IU	20000 IU	12350 IU	
	Vitamin D	2660 IU	1330 IU	1500 IU	2000 IU		
	Folic Acid	60 mg	30 mg	7.5 mg	15 mg	20 mg	
	B-1 Thiamine	40 mg	20 mg	6 mg	45 mg	140 mg	
	B-2 Riboflavin	50 mg	25 mg	10 mg	30 mg	140 mg	
	B-3 Niacin	125 mg	62 mg	25 mg	38 mg	300 mg	
	B-5 Pantothenic Acid	42 mg	21 mg	48 mg	15 mg	300 mg	
	B6 Pyridoxine	18 mg	9 mg	20 mg	15 mg	42 mg	25 mg
	B-12 Cyanocobalamin	1.5 mg	.75 mg	.03 mg	0.45 mg	1.6 mg	
	Choline	275 mg	137 mg	100 mg	75 mg		
Minerals	Beta Carotene	4 mg	2 mg				
	Calcium	1818 mg	909 mg	530 mg	2800 mg		
	Phosphorous	990 mg	445 mg	750 mg	1300 mg		
	Sodium Chloride/Salt	1142 mg	571 mg	1450 mg	2200 mg	14850 mg	
	Magnesium	859 mg	429 mg	450 mg	900 mg	9100 mg	
	Potassium	1245 mg	622 mg	2000 mg			
	Sulfur	277 mg	138 mg	2800 mg			
	Copper	75 mg	37.5 mg	13 mg	95 mg		100 mg
	Iron	250 mg	125 mg	300 mg	3 mg	560 mg	
	Manganese	250 mg	125 mg	130 mg	190 mg		
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CONTRAINDICATIONS: Horses with hypersensitivity to clodronate disodium should not receive OSFOS.

WARNINGS: Do not use in horses intended for human consumption.

HUMAN WARNINGS: Not for human use. Keep this and all drugs out of the reach of children. Consult a physician in case of accidental human exposure.

PRECAUTIONS: As a class, bisphosphonates may be associated with gastrointestinal and renal toxicity. Sensitivity to drug associated adverse reactions varies with the individual patient. Renal and gastrointestinal adverse reactions may be associated with plasma concentrations of the drug. Bisphosphonates are excreted by the kidney; therefore, conditions causing renal impairment may increase plasma bisphosphonate concentrations resulting in an increased risk for adverse reactions. Concurrent administration of other potentially nephrotoxic drugs should be approached with caution and renal function should be monitored. Use of bisphosphonates in patients with conditions or diseases affecting renal function is not recommended. Administration of bisphosphonates has been associated with abdominal pain (colic), discomfort, and agitation in horses. Clinical signs usually occur shortly after drug administration and may be associated with alterations in intestinal motility. In horses treated with OSFOS these clinical signs usually began within 2 hours of treatment. Horses should be monitored for at least 2 hours following administration of OSFOS.

Bisphosphonates affect plasma concentrations of some minerals and electrolytes such as calcium, magnesium and potassium, immediately post-treatment, with effects lasting up to several hours. Caution should be used when administering bisphosphonates to horses with conditions affecting mineral or electrolyte homeostasis (e.g. hyperkalemic periodic paralysis, hypocalcemia, etc.).

The safe use of OSFOS has not been evaluated in horses less than 4 years of age. The effect of bisphosphonates on the skeleton of growing horses has not been studied; however, bisphosphonates inhibit osteoclast activity which impacts bone turnover and may affect bone growth.

Bisphosphonates should not be used in pregnant or lactating mares, or mares intended for breeding. The safe use of OSFOS has not been evaluated in breeding horses or pregnant or lactating mares. Bisphosphonates are incorporated into the bone matrix, from where they are gradually released over periods of months to years. The extent of bisphosphonate incorporation into adult bone, and hence, the amount available for release back into the systemic circulation, is directly related to the total dose and duration of bisphosphonate use. Bisphosphonates have been shown to cause fetal developmental abnormalities in laboratory animals. The uptake of bisphosphonates into fetal bone may be greater than into maternal bone creating a possible risk for skeletal or other abnormalities in the fetus. Many drugs, including bisphosphonates, may be excreted in milk and may be absorbed by nursing animals.

Increased bone fragility has been observed in animals treated with bisphosphonates at high doses or for long periods of time. Bisphosphonates inhibit bone resorption and decrease bone turnover which may lead to an inability to repair micro damage within the bone. In humans, atypical femur fractures have been reported in patients on long term bisphosphonate therapy; however, a causal relationship has not been established.

ADVERSE REACTIONS: The most common adverse reactions reported in the field study were clinical signs of discomfort or nervousness, colic and/or pawing. Other signs reported were lip licking, yawning, head shaking, injection site swelling, and hives/pruritis.

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Time to celebrate

I'd like to see Deb Bennett, PhD, show us some research on Triple Crown winner American Pharoah. I am not a Thoroughbred owner, but I have read her Conformation Insights series and learned so much from her. I think others would be interested in her insight about this horse, his background, and what it is about him that enabled him to win.

Heather West
New Lebanon, Ohio

Editor's note: Look to our November issue for a Special Report on American Pharoah and his Triple Crown victory. Plans for this special section include an introduction by best-selling author Laura Hillenbrand, an analysis of American Pharoah's conformation and pedigree by Deb Bennett, PhD, and essays by the Daily Racing Form executive columnist Jay Hovdey and racing journalist, author and historian William Nack.

Lost and found

Thank you for "When Horse Theft Is Not a 'Crime'" (EQUUS 455). I had a horse stolen who was a triple great-granddaughter of *Witez II, the horse General Patton rescued during World War II and brought back to the United States to sire the Polish Arabian breed here.

With the help of police and brand inspectors, we tracked my stolen mare all the way across Washington State. Finally, we found her in the far corner of the state. I had been warned that in the state of Washington possession is nine-tenths of the law, so the only way to get a horse back is to go to court, even if it is stolen.

The sheriff, who was also the brand inspector, could not take us onto the property where the horse was. He said it would be trespassing. But he knew the

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- **Case Report** (1,000 to 2,500 words)—Equine practitioners and horse owners share their accounts of unusual or baffling cases of equine illness or injury.
- **Features** generally run from 1,600 to 3,000 words.
- **Hands On** (100 to 400 words)—Short items offering practical advice and useful reminders on everyday horse care issues, ranging from feeding and hoof care to training and breeding.
- **Medical Front** (200 to 400 words)—Brief articles about the latest research, technological advances, treatments and other veterinary topics pertinent to horse owners.
- **True Tale** (700 to 2,000 words)—True stories that focus on particular experiences that typify the multifaceted relationships we have with our horses.
- **Perspective** (700 to 2,000 words)—Personal insights and opinions on various topics of importance to the horse world.

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people and said he would talk to them, and if he flashed his lights we could come down. We waited what seemed like forever, until finally he flashed his lights; when we drove up, he told us to go get the horse and put her in the trailer before they changed their minds. We did and brought her home.

I wrote a book about this horse and the many other life-and-death miracles she has been through, called *Star's Miracles and More*.

Rosemary Gustafson
Ferndale, Washington

Riding with compassion

I was very pleased to see the book excerpt "A Compassionate Approach to Training and Showing" (EQUUS 456). I have been riding since I was a boy. One of the first things I learned from my riding master in Switzerland was to ride with feeling and to attain a sympathetic, caring relationship with whatever horse you're on.

I find that working with a horse is highly relaxing and has a calming effect. One of my favorite experiences is when the horse and I are alone in the arena on a Saturday, just practicing, and we come together as one. Something special happens, and the horse responds to the gentlest of aids. I have been told that it looks like I am doing nothing in the saddle, but the horse always responds. It seems like we always do our best work on Saturdays, or perhaps spoiling the horse with carrots afterward is the real reason.

On one recent weekend, I saw

evidence of my horse's compassion toward me. He always stands quietly for the five minutes or so I need to mount because of my weak left leg. When my leg collapsed in the stirrup and I fell backward onto the mounting block, I mounted anyway, and my horse actually turned his neck backward to see if I was settled in the saddle. That Saturday it was difficult to get him to even trot. He wasn't convinced that all was well with his rider. I cut

our ride short because my leg started to hurt (I had sprained it). When I dismounted, my leg collapsed at the knee again and I grabbed onto my horse's neck to avoid falling. He turned his neck and gently nuzzled me as if to say, "You're hurt. It's OK."

Some people say that horses have no emotions and no feelings. They are wrong.

John Maieron
Blue Bell, Pennsylvania

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HOW CUSHING'S DISEASE AFFECTS IMMUNITY



New research from Oklahoma State University helps explain why horses with the hormonal disorder pituitary pars intermedia dysfunction (PPID, also known as Cushing's disease) can be more susceptible to infection.

In a two-phase study, the researchers analyzed blood samples from 23 horses with PPID and 39 who were healthy. They specifically investigated the processes that

immune cells called neutrophils use to neutralize infectious or inflammatory agents and help the body heal.

"Neutrophils migrate to areas of infection or inflammation in a process called chemotaxis. To exit the blood vessels, neutrophils first stick onto the vessel walls, a process known as adhesion.

Without adhesion and chemotaxis the neutrophils can't get to the site of infection or inflammation," explains Dianne McFarlane, DVM, PhD. "Once they arrive [at an area of inflammation] neutrophils can engulf foreign or necrotic material including bacteria—a process called

Reference: "Neutrophil function in healthy aged horses and horses with pituitary dysfunction," *Veterinary Immunology and Immunopathology*, June 2015

phagocytosis. They are able to kill bacteria by releasing enzymes and chemicals, a process known as oxidative burst. Together, these four actions of neutrophils are necessary for a robust immune system."

McFarlane and her team discovered that horses with PPID had significantly reduced oxidative burst activity and adhesion than did healthy horses. None of the study horses had active infections, and the reduction in these functions was not correlated to severity of PPID.

McFarlane says this study underscores the importance of managing PPID horses

VULNERABLE: Horses with pituitary pars intermedia dysfunction (Cushing's disease) can have a harder time fighting infection.

with medication to balance their hormone concentrations and avoid secondary infections. "In older horses with infections that are not responding well to treatment, it is important to determine their PPID status," she says. "Even when giving the correct antibiotics, it can be very difficult to cure infections in horses with high concentrations of immunosuppressive hormones such as occurs in horses with PPID."

VARIATIONS IN DRUG ABSORPTION STUDIED

A study from Poland suggests that a horse's diet can affect how quickly he absorbs the medications he receives.

Investigating reports of resistance to ivermectin among cyathostomes (small strongyles) in their region, researchers at the University of Warmia and Mazury in Olsztyn tested the absorption rate of the drug in horses at different times of the year.

For the first phase of the study, which was conducted in May, nine warmblood horses were given a standard dose of ivermectin and had their blood drawn at regular intervals for analysis of medication levels. Fecal samples were also collected before and periodically after the ivermectin treatment to determine its efficacy against parasites. The following November, the researchers repeated the same procedures with the same horses.

The data showed that the speed of ivermectin absorption varied with the seasons. Blood concentrations of ivermectin were significantly higher during the first four hours after administration in



EQUINE FACIAL EXPRESSIONS ANALYZED

From pinned ears to a cocked hoof, the messages horses convey through body language are well known. Now work is underway in England to find out if they use their faces to communicate as well.

Researchers at the University of Sussex have developed the Equine Facial Action Coding System (EquiFACS) to classify the facial expressions of horses. Formulated based on observations of 86 horses, of various ages and breeds, made using high-tech video, the EquiFACS is an adaptation of a system originally developed for humans and then modified for use in other animals including chimpanzees, dogs and cats.

Through in-depth analysis of each horse's facial musculature and characteristics during naturally occurring behaviors, the researchers documented 17 distinct and universal facial movements, such as a "mouth stretch" and "nostril lift," that may be used in communication. By comparison, FACS have cataloged 27 such movements in human faces, 16 in dogs and 13 in chimpanzees.

The researchers hope the EquiFACS will provide an objective method for describing the facial expression in horses that will help people determine when they are in pain or are feeling well.

Reference: "EquiFACS: The Equine Facial Action Coding System," *PLOS ONE*, August 2015

the spring trials, compared to those conducted in the autumn. This effect was only temporary, however. Maximum blood concentrations of ivermectin were achieved within 36 hours of administration among all of the horses in both spring and autumn.

The researchers speculate that diet, rather than season of year, accounts for the variability in absorption. During the spring trials, the study horses were turned out full-time and ate more grass;

in the autumn, they were kept in stalls, shared paddocks and consumed more hay. "Hay has a much bigger content of crude fiber that can absorb and bond the drug in the intestines," explains Rajmund Sokół, DVM.

Fortunately, this slower absorption rate had no effect on ivermectin's efficacy. The researchers found complete elimination of parasite eggs from the fecal samples within four days of treatment in both study periods. "In our

Reference: "A comparison of the efficacy and pharmacokinetics of ivermectin after spring and autumn treatments against Cyathostominae in horses," *Polish Journal of Veterinary Sciences*, February 2015

opinion, the dose of drug was large enough to be effective even in case of poor intestinal absorption," says Sokol.

Nonetheless, he adds, these findings raise questions about how diet may affect the absorption of other medications. "We have tested ivermectin only, but it is quite probable with other drugs," he says. "This problem is better described in human pharmacokinetics, as various food and beverages can influence the bioavailability of drugs."

GENE RESPONSIBLE FOR CONNEMARA HOOF PROBLEM IDENTIFIED

University of California-Davis researchers recently discovered the genetic mutation that causes a rare hoof disorder in Connemara ponies.

In hoof wall separation disease (HWSD), the hoof wall splits along its weight-bearing surface. HWSD is often confused with laminitis⁰ or white⁰ line disease, but it differs from those conditions in that the separation



foal develops the condition.

Researchers at the Bannasch Laboratory, which is part of the UC-Davis School of Veterinary Medicine, used an approach called genome-wide association analysis to first identify the chromosome where the defective gene was located.

Through whole genome sequencing, they identified a mutation in the gene that produces a protein called SERPINB11. In a study population of more than 300 Connemara ponies, 23 were found to have double copies of the faulty gene and all showed signs of HWSD. None of the control horses, who had normal hooves, carried two copies of the gene.

Noting that horses with HWSD usually have two normal parents and begin showing signs by the time they are a year old, the California researchers suspected that the condition was autosomal recessive, which means it is expressed only in individuals who carry two copies of a mutated gene.

Although BUNV is relatively rare, the researchers note that this finding underscores the potential threat to equine health as new strains emerge.

The researchers also determined that approximately one in seven unaffected ponies carried one copy of the mutated gene. Noting that the role SERPINB11 plays in the production and maintenance of normal hoof wall tissue is still unclear, they call for further investigation. ☀

Reference: "SERPINB11 frameshift variant associated with novel hoof specific phenotype in Connemara ponies," *PLOS Genetics*, April 2015

FIRST EQUINE CASES OF BUNYAMWERA VIRUS REPORTED

Argentinean researchers have identified the first equine cases of neurological disease caused by Bunyamwera virus (BUNV).

An emerging cause of disease in humans and ruminants, BUNV is typically transmitted by mosquitoes. The BUNV family of viruses includes more than 300 different strains, all of which can exchange genetic material to produce new pathogens.

Until now there had been no reports in the scientific literature of BUNV causing

neurological disease in horses. But researchers at the National University of Cordoba and The National University of the Littoral found new isolates of the virus in the brains of three horses who died of encephalitis (swelling of the brain), in the Santa Fe region of Argentina.

Although BUNV is relatively rare, the researchers note that this finding underscores the potential threat to equine health as new strains emerge.

Reference: "First isolation of Bunyamwera virus (Bunyaviridae family) from horses with neurological disease and an abortion in Argentina," *The Veterinary Journal*, June 2015

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TREATS, NOT TRICKS

In a season when treats abound, you may be tempted to give your horse a few extra goodies. For a horse with insulin sensitivity, however, it's best to avoid even occasional sugary treats. And it's not just sugar cubes and peppermints you need to skip—too many apples and carrots may also trigger a glycemic response (an increase in blood sugar) that can cause a laminitic episode. You can still indulge your horse safely, however, if you follow a few basic guidelines:

- **Give tiny portions.** You don't need to give your horse the entire bag of carrots, which will overload him with sugar. He will be happy with a single piece.

- **Buy low-glycemic treats.** Many commercial horse treats are made specifically for horses with sugar and/or carbohydrate sensitivity. Check the label to be certain, and remember that molasses is a form of sugar.

- **Consider a nutty alternative.** A single roasted peanut in the shell is a traditional treat that has a lower glycemic index than fruits or vegetables. Peanut allergies aren't an issue in horses.



POP QUIZ TROUBLE AFOOT

Q: The arrival of colder weather means changes to more than just your horse's coat. Which of the following is true about your horse's hooves during winter?

- a. They crack more easily.
- b. They grow more slowly.
- c. They become darker.
- d. They are more prone to abscesses.

For the answer, see page 21.

BATTLING BOTS

That slight nip in the air isn't the only sign that autumn is on its way—you may also be finding tiny yellow botfly eggs dotting your horse's forelegs.

"Bots" is the catchall term given to the eggs, larvae and adult stages of the *Gasterophilus* genus of parasitic flies. At this time of year, the more common botfly species deposit sticky yellow or grayish eggs on the hairs of a horse's legs; some species also lay eggs on the mane and the underside of the jaw. A single female fly can lay as many as 1,000 eggs between the end of August and the first hard frost.

Warmth and moisture, often provided when the horse licks the area, encourage the eggs to hatch, and the larvae then embed themselves in the horse's lips and mouth. There they remain about three weeks before they emerge and are swallowed to attach themselves to the lining of the stomach or small intestine with their sharp, hooked mouths. About seven months

A close-up photograph of three horses in a field. In the center is a light brown or tan horse with a white blaze on its forehead and a dark brown mane. To its left is the head of a darker brown or reddish-brown horse. To its right is the profile of a dark brown or black horse. The background is a soft-focus green landscape.

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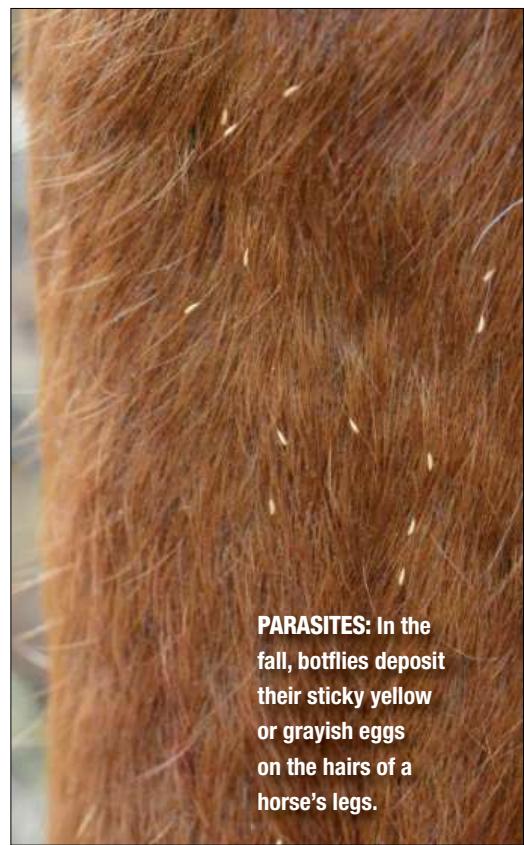
At least once each fall, my horse comes in from the pasture with his mane and forelock matted with burrs. I remove them by hand with the help of baby oil and recently discovered that thick work gloves with rubberized palms make that job much less painful for me.—*Melissa Barnes, Eldersburg, Maryland*

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later, the larvae detach and exit with the manure. After a few weeks, they emerge as adult flies ready to lay eggs and start the cycle anew. Removing manure from pastures two or more times a week will help break the cycle.

An extensive bot infestation can lead to colic, but ivermectin is very effective against this parasite. A single dose given after fly activity ends for

the year, November or December in North America, will kill ingested larvae. You can also protect your horse by removing any bot eggs you find before they hatch. Scraping the sticky eggs off of the hairs is easier with the curved, serrated “bot egg knives” made for the purpose or with fiberglass blocks that you run over the legs.



PARASITES: In the fall, botflies deposit their sticky yellow or grayish eggs on the hairs of a horse's legs.

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not cleaning enough and cleaning all the time, here's a practical guide to the care leather needs when.

After each ride: Wipe strap goods and your saddle down with a damp sponge or cloth, removing dust and hair—no need to unbuckle and disassemble the bridle. If particular items have gotten wet with sweat, such as the underside of the girth or a breast plate, add a touch of saddle soap to the sponge or rag as you work; leaving salt on the leather will break it down over time. To finish, rinse the bit off by dunking it in a bucket.

Once a month (or twice if you ride every day): Take your tack apart to clean and condition it. Given that you don't do this task very often, resolve to do it thoroughly, removing all dirt from the underside of straps and reaching into the corners of the saddle that no one is ever going to see. Scrub the bit well, working at stubborn gunk with a stiff

POP QUIZ Answer

b. and d. A horse's hooves grow more slowly during the winter months as the result of many factors, including changes in nutrition, exercise and circulation. In addition, alternating spells of wet and dry weather during the winter can cause hooves to expand and contract, allowing bacteria to enter the capsule and abscesses to develop.

toothbrush. When everything is clean, condition the leather and reassemble your tack, inspecting it for signs of wear and weakness as you do.

On an as-needed basis: If your tack gets muddy, wet or develops mold, you won't be able to put off cleaning. Any of these issues will cause leather to break down quickly, and they need to be addressed right away. When the leather is back in shape, you can resume your real-world tack-care schedule. ☀

PHOTOS: DUSTY PERIN

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Saving Sunny

More than most horses, Sunny likes to toss his head while cavorting in his pasture. This habit makes the 13-year-old Arabian gelding easy to spot as he chases his herdmates or gallops off on his own.

"He's just a big goofball," says Sue Apel, who purchased Sunny as a yearling. After a brief career in the show ring under his registered name, JD Rashik Sundown, Sunny eventually settled into life as a trail horse. He became known as a trustworthy, steady mount; his silly head-tossing habit was evident only when he was at liberty in the pasture. But on Memorial Day 2013, that quirk led to a serious injury that threatened his future.

Apel had family over to her Evansville, Wyoming, property for a holiday barbecue, and her small herd—Sunny and two mares—was turned out for the day on new spring grass. "They hang out in a pen made of panels that slide together and are secured with pins," says Apel. "That morning, I had opened up two panels and pulled them toward the inside of the pen so the horses could go out into the larger adjacent field. They'd have to come back to the pen to get water, which was about 75 feet away from the panel opening, but it wasn't an issue for most of the day."

In the early afternoon, however, Apel looked out her kitchen window and noticed that her mares were grazing the field and Sunny was nowhere to be seen. "That was unusual because he's always with them," she says. Moving to another window, she spotted Sunny, standing alone in the smaller pen area.

Worried, Apel walked down the driveway to the pen. Even before she made it through the gate, she could see

When a pasture accident leaves a gelding with a massive facial wound, a family works together to help him heal.

By Christine Barakat



something was terribly wrong. "His head was hanging just a little and I could see skin hanging from the left side of his face," she says. "I ran to the gate and scrambled over instead of opening it, but he never moved. When I got up to him I could see the damage he had done. It looked as if the left side of his face had been torn off."

Sunny had a gruesome tear—not even a tidy cut—in his face starting just below his eye, extending down about six inches. From that wound, the skin had pulled back toward his ear. Through the blood, Apel could see bone and even the roots of a few of Sunny's teeth.

"I screamed and ran for the house," says Apel, whose husband and kids met her halfway down the drive. She told them to call the veterinarian, then turned back to tend to her gelding. "I couldn't put a halter on him, obviously,

so I just tossed a lead rope around his neck and led him to a stall. He stayed nice and calm, even while all the humans were running around in a panic. I'm sure he must have been in pain, but he wasn't acting like it."

While one of her sons stood with Sunny awaiting the veterinarian, Apel began looking for clues to the cause of the injury. "When I saw a bit of blood and skin on one of the open panel pins, it wasn't hard to imagine what happened," she says. "He probably came up for a drink with the mares and the

SAFE DISTANCE: Sunny has fully recovered. But he is now turned out on his own, separated from his former pasturemates. girls wandered back out to the field without him noticing. Then, when he realized he was alone, he probably did one of those head tosses of his

and lodged the pin right under his eye. When he reacted and ran off, the pin pulled down the length of his face."

The veterinarian arrived and assessed Sunny's situation. "He told me that this type of wound was beyond what he was equipped to care for. He told me that I needed to get Sunny to a referral clinic as soon as possible, and he recommended Dr. Vlahos."

Rocky Mountain Equine Hospital, the practice belonging to Ted Vlahos, DVM, has two offices in Wyoming—in the towns of Sheridan and Cody—and one in Billings, Montana. The closest one to Apel, Sheridan, was 160 miles away from Evansville. It was a long trailer ride for a horse with a serious wound. "My husband and mom went with me. I think I cried the entire way," says Apel. "Sunny was so quiet the entire ride that I was scared of what I'd

find when we got there and I opened the trailer, but there he was—quiet and calm. There wasn't even a whole lot of blood in the trailer."

A veterinary team was ready to meet them when they arrived late in the evening. Apart from the large wound on the side of his face, Sunny was in good shape. His vital signs were stable, and the bleeding had tapered off. The team started him on intravenous fluids to ensure he stayed hydrated, along with an antibiotic injection and a painkiller. Vlahos himself was returning from an out-of-town trip and wouldn't be at the clinic until morning.

With nothing left to do but wait, Apel headed home for a restless night of worrying about her horse. "The wait was awful," she says. "I was sure Vlahos was going to tell me there was nothing he could do, and I'd have to put Sunny down. I had prepared myself for the worst and had my mom and my



"We hear 'head wound' in humans and think the worst," says Ted Vlahos, DVM, "but the horse's brain is tucked up safely behind his ears, so it's more a matter of healing tissues than neurological trauma."

husband there to help me cope when I finally heard it."

Instead, Apel was stunned when Vlahos called the next morning to say he thought Sunny might be OK.

"It was a pretty nasty wound," says Vlahos. "No doubt about it. He basically removed the covering to his maxillary sinus cavity on the left side of his face. The skin was gone and much of the bone covering the sinus was either gone or badly damaged. The affected area was about the size

of a deck of playing cards."

Still, Vlahos believed the wound could heal well. "Head wounds are shocking when you first see them, but the outcome can actually be quite good," says Vlahos. "The head is a tremendously vascular area so wounds tend to granulate quickly and well, and proud flesh isn't typically an issue. We hear 'head wound' in humans and think the worst, but the horse's brain is tucked up safely behind his ears, so it's more a matter of healing tissues than neurological trauma."

Even the lost and damaged bone wasn't a big concern. "The bone plate is very thin in that area," says Vlahos. "In a healthy wound, it fills in well with osteoblasts that lay down more bone. The bone here doesn't have to strengthen like a cannon bone fracture does because the skull isn't weight bearing."

Radiographs offered more good news: The orbital bones around Sunny's eye were intact, as were his teeth. "In wounds in this location we worry about the integrity of the orbital rim and the nearby nasolacrimal duct [tear duct]," says Vlahos. "You can have

long-term issues in terms of vision and persistent draining from the eye. You can also have damaged tooth roots, leading to tooth loss." Another possibility was damage to the facial nerves that control sensory and motor functions in the head. "You can never know for sure, but our early assessment was that this horse looked good on all those counts," Vlahos says.

Apel listened carefully, trying to process all this information: "When I heard he might be saved, I asked about

his quality of life and whether or not he'd be rideable. Dr. Vlahos told me he couldn't say for sure if I'd ever be able to ride him, but that there was a good chance he'd have a happy, pain-free life. I told him that I'd be ecstatic with that; if Sunny could just stand in my field and not be in pain, I was ready to do whatever it took."

For safe, clean healing

To help the wound heal, Vlahos first needed to debride the area—to clear away all dead material and bone fragments, as well as tissue and bone that was so badly damaged it was likely to die. "In any wound, if infection sets in, you can have a real problem," says Vlahos. "In a wound this large, that risk is even higher. Removing any non-viable tissues is an important first step in preventing infection."

The surgical team sedated Sunny before beginning the work. "You cut away anything that doesn't look absolutely healthy," says Vlahos. "In this case, it was a significant amount of tissue. By the time we were done, looking at the wound area was basically looking into a hole in [Sunny's] face."

With the wound debrided, Vlahos reexamined the damage to the orbital bone just below the eye. He decided to strengthen the area with a small amount of bone cement. "In some horses, we are rebuilding bone with the cement, but in this case it was more a precaution," he says. "We just wanted to shore up the area a little bit."

Vlahos opted not to try to suture the wound. Not only was there very little tissue to pull across the opening, but leaving the wound open would allow it to drain and be flushed regularly. "We'd pour a large amount of saline solution directly into the wound, and it would pour through the sinus cavity and out his mouth and nose," says Vlahos. "We



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Legend® Multi Dose (hyaluronate sodium) Injectable Solution, Legend (hyaluronate sodium) Injectable Solution, BRIEF SUMMARY: Prior to use please consult the product insert, a summary of which follows: **CAUTION:** Federal Law restricts this drug to use by or on the order of a licensed veterinarian. **INDICATIONS:** Legend® Injectable Solution and Legend® Multi Dose Injectable Solution are indicated in the treatment of equine joint dysfunction associated with equine osteoarthritis. **CONTRAINDICATIONS:** There are no known contraindications for the use of Legend® Injectable Solution and Legend® Multi Dose Injectable Solution in horses. **RESIDUE WARNINGS:** Do not use in horses intended for human consumption. **HUMAN WARNINGS:** Not for use in humans. Keep out of reach of children. **ANIMAL SAFETY WARNING:** For Legend Injectable Solution 4 mL and Legend Multi Dose Injectable Solution – Not for Intra-articular use. **The Intra-articular safety of hyaluronate sodium with benzyl alcohol has not been evaluated.** **PRECAUTIONS:** Complete lameness evaluation should be conducted by a veterinarian. Sterile procedure during the injection process must be followed. Intra-articular injections should not be made through skin that is inflamed, infected or has had a topical product applied. The safety of Legend Injectable Solution and Legend Multi Dose has not been evaluated in breeding stallions or in breeding, pregnant or lactating mares. **ADVERSE REACTIONS:** No side effects were observed in Legend Injectable Solution clinical field trials. Side effects reported post-approval: Following **intravenous** use: Occasional depression, lethargy, and fever. Following **intra-articular** (Legend Injectable Solution – 2 mL only) use: joint or injection site swelling and joint pain. For medical emergencies or to report adverse reactions, call 1-800-422-9874. **ANIMAL SAFETY SUMMARY:** Animal safety studies utilizing Legend Multi Dose Injectable Solution were not performed. Legend Multi Dose Injectable Solution was approved based on the conclusion that the safety of Legend Multi Dose Injectable Solution will not differ from that demonstrated for the original formulation of Legend Injectable Solution. Legend Injectable Solution was administered to normal horses at one, three and five times the recommended intra-articular dosage of 20 mg and the intravenous dose of 40 mg. Treatments were given weekly for nine consecutive weeks. No adverse clinical or clinical pathologic signs were observed. Injection site swelling of the joint capsule was similar to that seen in the saline treated control horses. No gross or histological lesions were observed in areas of the treated joint. For customer care or to obtain product information, including a Material Safety Data Sheet, call 1-888-637-4251 Option 2. ®LEGEND is a registered trademark of Merial. ©2015 Merial, Inc., Duluth, GA. All rights reserved. EQUIOLG1512-A (03/15)

HOW WOUNDS HEAL

did this several times a day in the beginning. I couldn't tell you how often, but the flushing, in addition to the antibiotics, was the way to fight infection."

Once the team finished the first flush, they coated the exposed tissues with an antiseptic ointment, then wrapped Sunny's entire head with protective bandages, placing a Plexiglas "cup" over his left eye for protection.

That's how he looked when Apel and her mother returned the next morning. "As soon as I stepped in the stall he came right to me, with this huge bandage on his whole head and his left eye covered," she says.

Vlahos told Apel that Sunny was eating and drinking well, with stable vital signs and a good attitude. He also showed her the radiographs and explained how, ideally, the healing would progress. He reiterated that it was still too early to determine how well the wound would heal or whether Sunny would be left with any long-term problems, but for now, things looked good.

Sunny remained at Rocky Mountain Equine for 18 days, as the staff continued to change his bandage and flush the wound twice a day at first, then once a day. Occasionally, Vlahos would identify and remove a bit of dying tissue, but overall he noted that the wound was filling in quickly with healthy granulation tissue, with no sign of infection.

Homecoming

Apel visited regularly and watched the bandage-changing process. Finally, Vlahos asked if she thought she could do it on her own. "I was nervous but more than ready to have Sunny home," she says. So, stocked with medications and supplies, as well as a long list of care instructions, Apel loaded Sunny into the trailer for the trip home.

"We made the trip with no

The process of growing new tissue to close a wound occurs in two distinct stages: granulation, a mixture of tiny blood vessels, connective tissue cells (fibroblasts) and collagen that fills in the gap; and epithelialization, the growth of new skin cells across the surface of the wound to close it.

If sutures are used to bring the edges of a wound together, the gap between the two sides is narrow, and both stages happen more or less simultaneously. This is called

"first intention" healing of a wound.

If a wound is wide, and too much tissue has been lost, it may be impossible to bring the edges together with sutures. In this case, the wound will be left open to heal. This is called "second intention" healing, and granulation and epithelialization occur at different rates:

- First, as soon as the wound occurs, blood and lymph fluids rush to the scene; blood platelets are stimulated to form long, sticky protein threads that dry into a clot to seal off the wound and protect it from contaminants. White blood cells also arrive to help fight infection. The platelets and other agents also release other factors that stimulate the next

stages of healing.

- Next, granulation tissue begins to form over the exposed surfaces within the wound. Because most wounds are narrowest at their deepest part, the gap usually closes from the inside outward.

As healing progresses, the granulation tissue pulls the edges of the wound together. Meanwhile, the wound continuously cleans itself, sloughing off fluids filled with dead cells and other wastes.

- Finally, epithelial cells multiply along the edges of the wound, growing outward from the edge of the skin, to cover and adhere to the bed of granulation tissue. If all goes well, epithelialization and granulation continue until the wound closes and healing is complete.

problems," says Apel, but I think the mares thought I brought an alien home since he still had his entire head bandaged and the funny mask with the plastic bubble on it." Sunny was settled into a large private stall in the barn, and he seemed happy to be at home.

The challenges began the following day, when it was time to clean and rebandage the wound. "My mom had agreed to come across town each day and help me do it," says Apel. "But even with the two of us it was still tough. I can wrap a leg no problem, but wrapping heads is really difficult. I think my hands shook through the whole thing; I didn't want to hurt him but I didn't want infection in it either and I didn't want the bandages to come off in the night."

Together, Apel and her mom managed to do the job, a process that became easier each day. "It wasn't nearly

as pretty as the vet tech's bandaging, but it did stay put," she says. "Sunny was awesome through the entire thing. He just stood there and took it like a man."

Each week for nearly two months, Apel and her mom took Sunny back to Vlahos for a follow-up. The wound continued to heal well, and after the first return visit, Vlahos told them they could reduce the bandage changes to every other day.

In late July, Vlahos told Apel to discontinue the bandaging and the antibiotics. The wound had filled in almost completely, and the swelling was minimal. The gelding's lip drooped a bit on the left side, as did his ear, but those issues were improving rapidly, which suggested no lasting damage to the nerves.

Finally, in mid-August, Vlahos turned to Apel and said, "Take him home and ride him."

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Apel was stunned. "I said, 'Just put a bridle on and go ride?' and he said he wanted to see Sunny again in a month, but it was time for him to go be a horse again."

The timing could not have been more poignant. For years, Apel and her mother had gone on a girls' trip to ride in Black Hills National Forest in South Dakota. Apel had assumed the trip was off for this year, but with Vlahos' blessing, it was back on. Just three months after she thought her horse would have to be put down, she was riding him through majestic mountain ranges.

"I told my mom that we'd have to take it easy, but he charged up the first hill and wasn't even breathing heavy when we got to the top," Apel says. "He was his old, wonderful self. I cried the first night when we got back from our ride just because I was so happy."

Now, more than two years later, Sunny's face shows a visible scar from his injury, but he appears to have sustained no lasting damage. His nerves function well, and he has no signs of excessive sinus drainage or damage to his teeth. Apel had one brief scare when Sunny's left eye clouded over shortly after she started riding him again. A quick trip to Vlahos' clinic assured her it was a small scratch on his eye, and a week of treatment cleared it up with no effect on his vision.

For her own peace of mind, Apel decided not to turn Sunny out with the mares; he now lives in his own separate paddock. "They can be pushy, and I worry he's going to get chased into something," she says. "I'm nervous, I guess."

Sunny, however, shows no lingering anxiety from his ordeal. "He still does that goofy head-shake," says Apel. "I saw him do it just the other day and I asked him, 'Don't you remember what happened, Silly?' I don't think he does."

To see pictures of Sunny's wound throughout the healing process, visit www.equusmagazine.com.



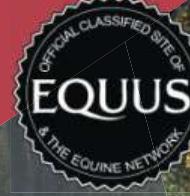
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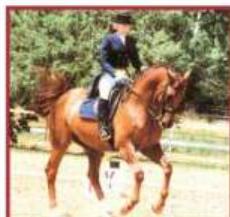
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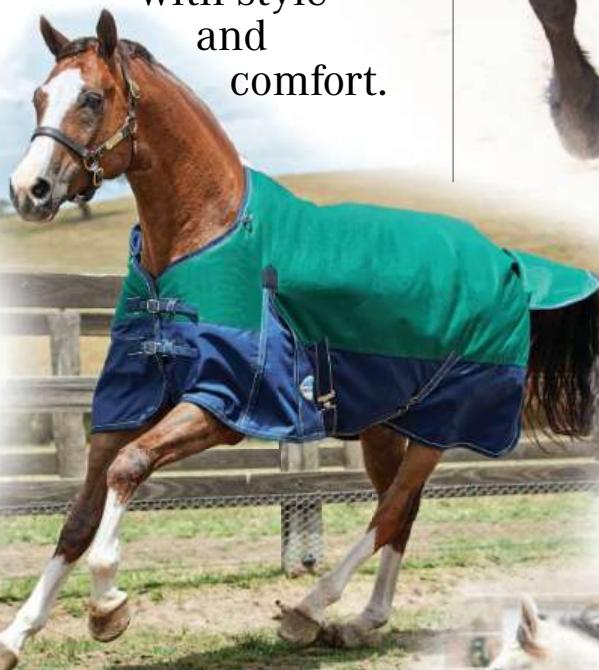
Source: Survey conducted in February 2014 of equine veterinarians who recommended oral joint health supplements.

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The medium/heavyweight **Tough 1 Waterproof Poly Turnout Blanket with Snuggit Neck**

(suggested retail, \$167.88), from JT International, features adjustable straps at the neckline for a customizable fit. The blanket is made with a 1,200-denier, waterproof ripstop outer shell with a 210 denier lining and 250 grams of polyfill. Other features include crossed surcings with elastic ends, adjustable leg straps, a tail flap and fleece to protect the withers. Available in sizes 69 to 84, in three-inch increments, in a paisley shimmer print. Visit www.tough-1.com.



The **Platinum Collection 1,680D 300g Heavy Weight Turnout Blanket**

Blanket (suggested retail, \$309.99), from Kensington Protective Products, has 300 grams of fiberfill insulation in a 1,680-denier, ballistic nylon outer shell that is Teflon-coated for 100 percent protection against wind and rain. For comfort, the blanket also features a CoolPlus lining system to draw body heat and wick moisture away from the skin. Other features include a detachable belly band, detachable crisscross belly straps and leg straps, and an adjustable front closure with snaps. Available in teal, raspberry, blue violet or onyx, in sizes 69 to 87 in three-inch increments. Call 909-469-1240 or visit www.kensingtonproducts.com.

For moderate weather, the **Original 1,200D Standard Neck Medium-Lite**

Blanket (suggested retail, \$134.99), from Weatherbeeta, has a 1,200-denier waterproof, breathable ripstop outer shell with 100 grams of polyfill insulation and a 210-denier polyester lining to keep your horse's coat smooth and shiny. The blanket also features twin chest buckles, low crossed surcings and elastic leg straps, and an extra-long tail flap. Available in sizes 66 to 87 in three-inch increments, in hunter/navy. Visit www.weatherbeeta.com.

Ready for cold or moderate weather, the **Limited Edition 30th Year Rambo Duo** (suggested retail, \$449), from Horseware Ireland, features a removable 300-gram antistatic, antibacterial liner, so the 100-gram, 1,000-denier ballistic nylon shell can be worn separately. The blanket also comes with a detachable 150-gram neck as well as three secure-cross surcings, reflective safety strips and a tail cover. Available in sizes 66 to 87 in three-inch increments, in green with red trim. Visit www.horseware.com.



Contoured for a good fit that minimizes rubbing, the **Frost Fighter Stable Blanket** (suggested retail, \$139.99), from Classic Equine, is made with a breathable, weather-resistant durable nylon outer shell, with a nylon lining and 300 grams of fiberfill insulation. Other features include replaceable nylon leg straps and an elastic front closure. Available in sizes S (74 to 76) to XL (83 to 85), in black or burgundy. Visit www.classicequine.com.



For extra protection from the elements, the **Ultimate High Neck Turnout Blanket** (suggested retail, \$209.95), from SmartPak Equine, features a high neck design that also reduces pressure on the withers. The medium-weight blanket has 220 grams of insulation with a 1,000-denier waterproof and breathable nylon outer shell, two low-cross surcings, clip front closures, nylon/elastic leg straps and a tail flap. Available in sizes 69 to 87 in three-inch increments, in black with gray trim and royal piping. Light and heavy weights are also available. Call 800-461-8898 or visit www.smartpak.com.

For all-season versatility, the **Bucas Select Turnout with 150g Stay-Dry Quilted Liner Rug** (suggested retail, \$347.95), from Toklat Originals, Inc., couples a 1,200-denier outer shell, which can also be worn as a rain sheet, with a 150-gram insulated quilted liner that can also serve as a stable blanket. Each layer includes shoulder darts for comfort, with a set of hidden surcings to allow both pieces to lie smoothly when worn together. A matching, detachable neck cover is available for both layers. Available in ruby or navy, each with gray trim and a navy liner, in sizes 69 to 84 in three-inch increments. Call 888-486-5528 or visit www.toklat.com.

For milder winter climates, the **Equisential 600D Winter Turnout**

Blanket (suggested retail, \$119.95), from Professional's Choice, offers a 600-denier ripstop outer shell with 250 grams of insulation. The blanket is breathable and water-resistant, with reinforced, taped seams, a tail flap, removable elastic leg straps and fleece at the withers. Available in sizes 70 to 82 in two-inch increments, in black/tan, giraffe, stars, tie-dye, high roller, camo, flame, pacific blue/silver or southwest/blue. A matching detachable neck cover is also available. Visit www.profchoice.com.



To maximize comfort and durability, the

StormShield VTEK Marathon Surcingle Lightweight Turnout

(suggested retail, \$169.99),

from Schneiders Saddlery Inc., is made with a 1,680-denier waterproof and windproof nylon outer cover with 80 grams of insulation and a nylon inner lining designed for enhanced breathability. The blanket also features a snap front with Velcro closures and crisscross surcingles as well as extended gussets, detachable elastic leg straps and a tail cover. Available in sizes 68 to 86 in two-inch increments, in red/black. Medium and heavy weights are also available. Call 800-365-1311 or visit www.sstack.com.

The StormBreaker Plus 220G

Blanket (suggested retail,

\$159.99), from Shires Equestrian, features an outer shell of 840-denier ballistic nylon,

with 220 grams of polyfill insulation. The blanket has adjustable chest clips and buckles, cross surcingles, leg straps, reflective strips, a tail flap and fleece at the withers. Available in sizes 72 to 87 in three-inch increments, in navy/turquoise. A matching detachable neck cover is also available. Call 603-929-3880 or visit www.shiresquestrian.com.



Designed to protect the mane and add warmth to any blanket, the **Headless Weatherproof**

Horse Hood (suggested retail,

\$75), from Snuggy Hoods Ltd., covers the neck, chest and withers with a breathable, machine-washable fabric. The hood is elasticized and adjustable around the top, with an extra-long cut so it sits close behind the horse's ears, even when his neck is extended for grazing. A seamless, shiny liner protects the coat, and a zipper runs from top to chest to allow for easy fitting. Available in black, in sizes XS to XXL. Visit www.snuggyhoodsusa.com. ●





Maple tree MENACE

The danger posed by wilted or dried red maple leaves has long been known but evidence is growing that, under the right circumstances, other types of maple leaves can poison horses as well.

By Hélène Ragoné, PhD

Mapple trees are commonly used for landscaping in many areas of North America and especially in the northeastern states. Some species such as the sugar maple are economically valuable for the production of maple syrup, and wood from the trees is used for the manufacture of furniture and musical instruments. However, some maple species have a sinister side—horses and ponies as well as donkeys, mules and zebras eating the fallen, wilted or dried leaves can be fatally poisoned.

Although the dangers of poisoning from one species, the red maple (*Acer rubrum*, also called swamp maple or soft maple), are well known, research suggests that other trees of the species, including the sugar and silver maples and their hybrids, may also pose a threat. In fact, cases of maple poisoning have been identified in horses that consumed wilted leaves from the sugar maple (*Acer saccharum*).

Horses are most likely to encounter wilted leaves after summer storms

bring down branches or blow leaves into pastures and paddocks. In the autumn, fallen maple leaves are generally less palatable to horses, but they also pose a serious threat when they are consumed. Fresh, green leaves of any maple species are less dangerous but may still contain some level of toxins. The bark and twigs of maple trees may also be toxic if consumed by horses.

“Red maple toxicity is not common, simply because most people feed their horses well and pay attention to what their horses are eating,” says Anthony Knight, BVSc, MS, DACVIM, a large animal veterinarian, plant toxicologist and professor emeritus at Colorado State University. “A horse may eat a few maple leaves on occasion, but an adult horse would need to eat one to two pounds of the dried or wilted maple leaves to be affected by the toxin. It is the dose that makes the poison.”

Still, to keep your horse safe, it’s a good idea to be able to identify the maple species—sugar and silver as well as red maples—because they are common in or around pastures and may be encountered on the trail.



THE NATURE OF THE THREAT

The danger posed by wilted or dried red maple leaves has long been recognized: Horses who consume them may sicken or die within hours or days. Toxins in the plant damage the hemoglobin in the horse's red blood cells, so they can no longer carry oxygen. Affected red cells may rupture, clogging the kidneys with waste products, and the liver and spleen will remove damaged cells from the bloodstream faster than they can be replaced by the bone marrow, which results in severe anemia.

Starved of oxygen, other tissues and organs begin to fail. Outward signs of red maple poisoning include lethargy, poor appetite, colic, pale yellowish gums that progress to dark muddy brown, increased heart rate, faster respiration and distinctive dark red to black-colored urine.

The speed and severity of red maple toxicosis depends on how many wilted leaves have been eaten relative to the horse's body weight.

The speed and severity of red maple toxicosis depends on how many wilted leaves have been eaten relative to the horse's body weight. As little as half a pound of wilted leaves can kill a small pony or miniature donkey; a pound or two can be a fatal dose for an average adult horse.

"If you see your horse eating fallen red maple leaves, first remove the horse from the source of the maple leaves, and call your veterinarian immediately," says Knight. Do not wait for signs to appear—your horse's best chance of survival depends on

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BIOLOGY

RED BLOOD CELLS

Hemoglobin molecules within red blood cells transport oxygen from the lungs to tissues throughout the body.

After hemoglobin molecules deliver their oxygen, they return carbon dioxide from the tissues back to the lungs.

oxygen from lungs

hemoglobin molecules

oxygen bonded with hemoglobin molecules

oxygen released to tissue cells

THE POISONING PROCESS

Wilted or dried red maple leaves contain toxins that damage the hemoglobin in the horse's red blood cells, leaving them unable to carry oxygen. Affected red cells may rupture, overwhelming the kidneys with waste products, and the liver and spleen will remove damaged cells from the bloodstream faster than they can be replaced by the bone marrow.

Starved of oxygen, other tissues and organs fail.



the earliest possible intervention.

There is no specific antidote to red maple toxicosis, but supportive treatment including intravenous fluids and possibly blood transfusions may help a horse survive long enough for the toxins to clear his system. "Some studies have shown that large amounts of vitamin C [a potent antioxidant] can counter the oxidative effect of the toxins," says Knight, "but that treatment has to be given very early to be effective."

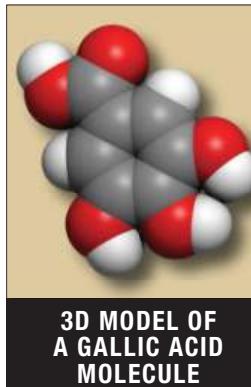
Once signs appear, a horse's odds of survival drop significantly, even with hospitalization. One 2006 study from North Carolina State University reviewed the cases of 32 horses with red maple poisoning admitted to referral hospitals in the Southeast. Of those cases, 29 horses were anemic, 24 had serious systemic inflammation, 12 had kidney dysfunction, nine had laminitis and 13 had colic—19 (59 percent) died.

The exact mechanism of poisoning has not been fully documented. Studies from Cornell University have uncovered significant clues. Compounds extracted from red, sugar, silver and Norway maple leaves incubated with equine blood samples caused oxidation, hemolysis (the breakdown of red blood cells) or other types of damage to the cells. Several chemicals were identified as toxic to the equine red blood cells, most notably gallic acid. "While gallic acid was a major player, most likely it is not the only player," says Jeanelle Boyer, PhD, who conducted the study. "Quite likely there is a synergistic effect in combination with other chemicals."

In the next phase of the research,

Boyer analyzed extracts from silver maple, sugar maple and Norway maple leaves and found that all contained some level of gallic acid. The extracts derived from the silver and sugar maples did less damage to the equine red cells than did the red maple extracts, but the changes were significant enough to be potentially harmful to a horse. The extracts drawn from the Norway maple were far less toxic. In fact, Boyer speculated that horses would most likely not be able to ingest enough Norway maple leaves to cause themselves any serious harm.

In a separate study, Cornell researchers Karyn Bischoff and Karan Agrawal investigated the effects of gallic acid and tannins from red maple



3D MODEL OF A GALLIC ACID MOLECULE

The study revealed another piece of the puzzle: The equine digestive tract contains microbes that can turn gallic acid into an even more damaging substance called pyrogallol.

leaves that were incubated with samples of digestive fluids drawn from the equine ileum, the lowest portion of the small intestine. Their findings revealed another piece of the puzzle: The equine digestive tract contains microbes that can turn gallic acid into an even more damaging substance called pyrogallol.

Maple toxicosis is unique to horses and other equids—it does not occur in sheep, cattle or other farm animals. The reason, says Knight, is that "horses do not have a digestive system like that of ruminants [such as cattle, sheep and goats] that can break down gallic acid into harmless components."



In general, the occasional nibble of fresh green leaves or twigs still on a red maple tree probably will do little harm to a horse, but dropped, wilted or dried leaves are dangerous.

DILUTING THE DANGER

The idea that even green maple leaves contain a toxin deadly to horses may be unsettling but, says Knight, they are likely to pose a significant threat only if they wilt or dry out: "This is because green maple leaves contain about 80 percent water. A horse would have

RED MAPLE *ACER RUBRUM*



to eat a huge amount to get a toxic dose, but when the water evaporates out as the leaves wilt and dry, the gallic acid in the leaves becomes more concentrated."

When leaves drop or break off and begin to dry out they can become toxic in as little as a day, and they can retain their toxicity for weeks, if not months. Branches and bark of the red maple tree also contain toxins, but most horses are not likely to eat enough of them to cause trouble.

In general, the occasional nibble of fresh green leaves or twigs still on



among 13 species native to the United States, and there are more than 100 introduced species, hybrids and cultivars (selectively bred variations, analogous to breeds of animals) that are popular with landscapers. So far, only a few have been tested for toxicity—but it's wise to assume that all maples may be potentially poisonous until proven otherwise.

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SUGAR MAPLE
ACER SACCHARUM



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a red maple tree probably will do little harm to a horse, but dropped, wilted or dried leaves are dangerous.

However, the caveat is that the concentrations of toxins in different parts of a tree may vary. The amount of gallic acid may vary with growing conditions, time of year and stage of leaf maturity. The majority of reported cases occur between June and October—which suggests that growing leaves become more toxic later in the season. The same may be true for sugar and silver maples.

Red, silver and sugar maples are

SILVER MAPLE
ACER SACCHARINUM



Maple toxicosis does not occur in sheep, cattle or other farm animals.

PREVENTING MAPLE POISONING

Eradicating all red and sugar maple trees that grow in or around horse properties is not practical or even advisable. But it is wise to consider the danger when choosing new trees. “When selecting trees to plant in or around horse pastures,” says Knight, “choose such trees as ash, fir, birch, hickory,

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hackberry, magnolia, etc. Avoid maples, oaks, boxelder, walnut and chinaberry because of their potential toxicity."

If there are existing maple trees on the property, take steps to reduce the risk for horses.

• Promptly remove

fallen branches and leaves from turnout areas.

Horses are most likely to encounter wilted red maple after a storm has dropped a tree branch or blown large numbers of green

leaves into a pasture. Make it a habit to inspect turnout areas after any storms, especially one that brought high winds, and do not return horses to the area until any fallen leaves and branches have been cleared.

If you have many mature trees,



FAST FACTS

The red maple is the state tree of Rhode Island. The sugar maple is the state tree of New York, Vermont, West Virginia and Wisconsin.

become high. If red or other dangerous maples are positioned where they consistently shed their leaves into turnout areas, rake and remove the leaves to keep them away from grazing horses. If maple leaf fall is especially heavy in some pastures, it may be

consider having an arborist inspect them. He may be able to identify weaker branches, which can be pruned out safely before they fall. An arborist may also identify unhealthy trees, which can be either treated or removed before they develop significant damage.

• Rake and remove

autumn leaves from pastures.

As maple leaves change color and dry out each fall, their toxicity levels

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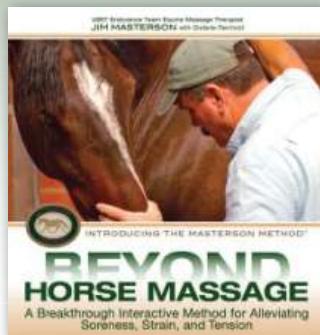
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If so many parts of the sugar and red maples are toxic to horses, is it dangerous to use maple syrup in a bran mash?

No, your maple-sweetened bran

mashes are safe. Gallic acid, the toxic agent in maple trees, is found in the tissue of the leaves and bark. The sap is the liquid that runs in the tree and contains virtually no gallic acid.



wisest to turn horses out in different areas for the season.

• **Fence off large maple trees**

in pastures. Gallic acid is present in bark and branches as well as the leaves, but few horses are likely to eat enough woody material to be affected. However, if the horse is a cribber or habitually chews on trees, it is a good idea to fence off the maples. The lower branches of maple trees should be regularly pruned to keep them out of reach of horses.

• **Monitor horses in dry lots.** Horses who are on good pasture or have free-choice access to hay are less likely to eat enough maple leaves to do them harm. Those restricted to dry lots with limited forage may be more inclined to reach over the fence for nearby branches or eat what falls into their area. A hungry horse is more likely to eat dried maple leaves.

• **Inspect hay.** If your hay is grown in an area where maple trees are common,

you may occasionally find fallen leaves incorporated in the bales. (This may be more likely to happen in fall cuttings.) Remove the leaves before offering the hay to horses.

• **Remove maple trees when necessary.**

If there are a combination of circumstances that could place horses at risk, such as a horse who cribs living in a pasture with old red maple trees, it might be best to remove the trees. Double-check the identity of the trees before removing them by showing the leaves to an extension agent or horticulturalist at a local nursery. Make sure all debris, including stray twigs and leaves, are removed from the field before returning horses to the area. Better yet, have the trees cut while they are leafless, to simplify cleanup and reduce the risk of leaves being left in the field.

With these simple precautions, the chances of red maple poisoning can be greatly reduced or eliminated. ●

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THE CHILL

*By Heather Smith
Thomas with
Christine Barakat*

Whether treating new trauma, managing healing injuries or simply helping keep hardworking horses sound, cold therapy is a powerful tool.

FACTOR



It sounds almost too good to be true, like the subject of a pitch from an old-timey snake-oil salesman: an easy-to-use, one-step, drug-free therapy that can minimize the effects of a recent musculoskeletal trauma and accelerate recovery from old injuries. And you'd be right to raise an eyebrow, thinking, "That cannot possibly exist." But it does, and it really is that good.

Cryotherapy—or, more simply, cold therapy—is one of the most effective methods for alleviating soft tissue-related aches and pains of hardworking horses. Whether it takes the form of ice, frigid water or one of a growing number of commercial "chill-down" products, cold therapy can aid the healing of musculoskeletal injuries both new and old, as well as help prevent them.

Yet this powerful technique is, generally speaking, underutilized by horsemen. "Cold therapy isn't applied as often as it could be but is very useful," says Bruce

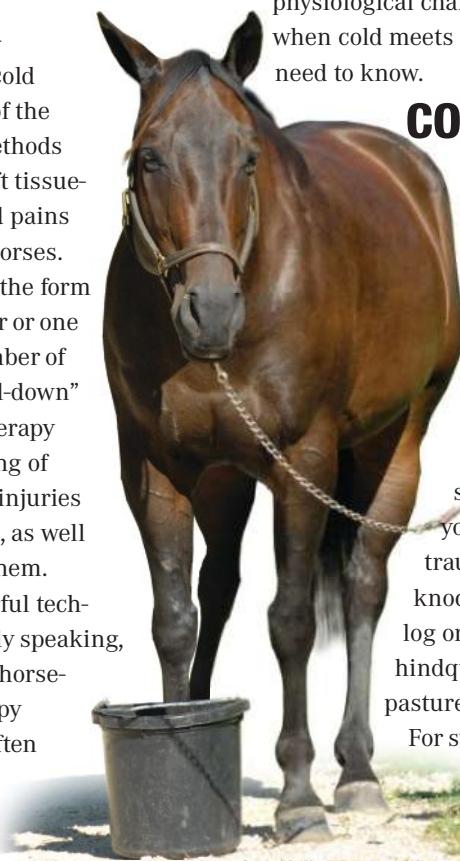
Connally, DVM, a veterinarian in Berthoud, Colorado. "It's been proven in both horses and in humans to work very well."

If you'd like to try using cold therapy on your horse, you can start today. Right now, even. Simplicity is a big part of its appeal: Turn on the hose, empty an ice tray and you're ready to go. But this form of therapy will be more effective if you understand something about the physiological changes set in motion when cold meets limb. Here's what you need to know.

COLD AS A FIRST AID

The benefits of cold therapy in treating acute injuries will be familiar to anyone who has plopped an ice pack on a newly twisted ankle. Something similar happens when you use ice to ease the trauma of a horse who knocks his fetlock on a log or gets nailed on the hindquarters by a kicking pasturemate.

For starters, cold has an analgesic effect, which means it more or less numbs



tissues that it touches. This makes the horse feel better almost immediately.

Meanwhile, another important physiological process is triggered by the cold. When a horse knocks a knee, pulls a tendon or otherwise injures himself, damaged blood vessels in the affected area begin to leak fluid into the surrounding tissues. This sets off an inflammatory cascade that we see as swelling and the horse feels as pain. Left alone, this leaking will stop naturally in about 12 to 36 hours, and the body's natural "cleanup" effort will begin as part of the healing process. Dramatically cooling tissues at a new injury site, however, causes the blood vessels to constrict, limiting the leakage that leads to inflammation. This means there is less for the body to clean up later, shortening total healing time.

"The benefits of cold in the acute stage [first two to three days after the injury] are great," says Kent Allen, DVM, a sport horse veterinarian in Middleburg, Virginia. "In those first days the cold therapy will slow blood flow, reduce pain perception and limit the amount of inflammatory mediators being released into the area. Thus it lowers cell metabolism, muscle contractility, nerve conduction, and significantly reduces the inflammatory response."

Application tip: In the case of acute injuries, time is of the essence. The moment you notice a lump or a limp, apply cold to the area, but keep an eye on your watch. "You only need to do it for about 20 or 30 minutes at a time," says Connally. "You don't have to do it continually." In fact, continual cold can damage tissues, and you'll want to allow for at least 30 minutes between treatments. For maximum effect, follow a 20-minutes-on, 30-minutes-off schedule as closely as you can for the first 36 hours after an injury.

Cold therapy can become part of a horse's wellness regimen after strenuous athletic effort.



COLD FOR OLDER INJURIES

Even after the acute phase of an injury has passed, cold therapy can still aid in recovery. "Another use of cold therapy, which many people tend to forget, is during rehabilitation," says Katie Seabaugh, DVM, of the University of Georgia and diplomate of the American College of Veterinary Sports Medicine and Rehabilitation. "After the injury is healing, it is helpful to incorporate cold therapy into a recovery plan."

Just as in application to an acute injury, the benefits of cold therapy in rehabilitation hinge on its vasoconstrictive effects. But when it's applied to older injuries there's a twist.

In treating acute injuries, the constriction of blood vessels by cold limits leakage and damage in tissues. In a rehabilitating horse, however, the leakage has stopped and it's the return of blood to the area after the cold is removed that is most helpful. The renewed circulation brings a "cleanup crew" of white blood cells and natural chemicals that destroy dead cells and clean up physiological debris. This cooling/warming cycle created by intervals of icing also generates a "pumping" action in the tissues that can encourage and speed healing.

Even after healing is well underway and swelling has dissipated, it's often wise to continue cold therapy even as the horse resumes his normal regimen. "If the horse has been off work for a long time during recovery, perhaps from a tendon injury, and is just starting exercise again, it is beneficial to apply cold therapy when that injured area is put back into work," says Seabaugh. "This can help minimize possible stress and inflammation as you get the newly

healed tissues working again."

Application tip: During the rehabilitation phase of an injury, cold therapy doesn't need to be applied as frequently as in the acute phase. One 20-minute session of icing after exercise will usually be adequate.

stretch tissues, which can lead to stocking up both in the short and long term. You can prevent most of this with cold therapy, which will help close up those vessels, restoring post-workout circulatory conditions quickly.

The effectiveness of post-workout



If an ice bucket won't work for your horse, there are other options. "Some horses do better with commercial ice boots or cold-water soaking boots you can strap on the lower leg, since they can move around while wearing them," says Kent Allen, DVM.

COLD FOR FASTER ATHLETIC RECOVERY

Cold therapy can also become part of a horse's wellness regimen after strenuous athletic effort. When a horse is working hard, capillaries that serve his muscles, tendons and ligaments expand to bring in needed blood. When work stops, however, that excess flow can persist and the now-unneeded fluid can bring with it enzymes associated with inflammation. As these fluids pool in the area, they make the horse sore and

cold therapy to hasten recovery is well documented in human athletes. "One article, for instance, showed the effectiveness of cold water immersion on post-match recovery in elite football players," says Seabaugh. "The players participated in a game and then completed performance tests 24 to 48 hours after the game, after being randomly assigned to different groups. One group utilized passive recovery, another utilized cold therapy recovery and another used contrast water therapy [hot and cold]. The only group that showed a



significant beneficial effect was the group that utilized cold-water immersion. Those athletes came back to peak performance faster and had less pain and fatigue after the match. Cold water immersion helped them get back to desired performance levels quicker."

After-activity icing has also been shown to help with the soreness that can accompany athletic efforts. "Another study looked at delayed-onset muscle soreness in humans, which is the stiffness/soreness you tend to get two days after the event," says Seabaugh. "The cold water immersion reduced this delayed-onset muscle soreness after exercise."

It's no surprise that many post-game television interviews are conducted with athletes immersed in tubs of ice, but it's still not a particularly common practice for horses outside of the racing world (see "A Time-Tested Technique," opposite).

"Human athletes often use ice packs taped to their shoulders or use an ice bath after a performance," says Seabaugh. "In racing, however, and in some performance disciplines, we see horses after a race or a strenuous workout standing in buckets of ice water or ice boots up to their elbows or past the hocks. These methods are being utilized by some parts of the horse industry, but there is not a lot of research on this. As we start to pay more attention to our equine athletes, however, beyond just racehorses, we will find there are benefits."

Application tip: Keep it simple when incorporating cold therapy into your post-workout care routine. After the horse has been walked until his respiration rate has returned to normal, apply whichever cooling

The simplest and most common form of cold therapy is hosing—running a stream of cold water directly over the area. This, however, isn't likely to lower tissue temperatures to the desired range.

method you choose to his limbs for about 20 to 30 minutes. There's no need to repeat the process if you're simply helping him recover as opposed to treating an identified injury.

"You don't get any additional benefit if you use cold therapy longer than about 30 or 40 minutes because after that you start getting the vasodilation effect," says Allen. "Standing a horse in a bucket of ice all day doesn't provide any more benefit. Using the cold too long is actually counterproductive."

COLD THERAPY METHODS

Regardless of why you are using cold therapy, your options for applying it are the same. From the simple to the high tech, all techniques have the same ultimate goal: to lower the temperature of targeted tissues. "Our target temperature within the tissues should be somewhere between 10 and 15 degrees Celsius, which is about 50 to 59 degrees Fahrenheit," says Seabaugh.

The simplest and most common form of cold therapy is hosing—running a stream of cold water directly over the area. This, however, isn't likely to lower tissue temperatures to the desired range. "[Hosing] is the most popular method, and your veterinarian may tell you to cold hose an injury or a limb for 15 to 30 minutes," says Seabaugh. "This is better than nothing, but it typically does not achieve cool enough temperatures needed for maximum benefit."



A TIME-TESTED TECHNIQUE

DUSTY PERIN

In horse racing, a sport known for its embrace of tradition, icing horses' legs has long been one of the more beneficial customs. "When I was training horses in the 1960s and 1970s everyone had horses lined up, standing in ice tubs," says Bill Casner, who has been involved with racing as a trainer, owner (2010 Derby Winner Super Saver was one of his) and executive his entire life. "One of the first things we did was get them accustomed to standing there with their feet in the tubs. It's labor intensive to train them to the ice tubs. Those young horses would turn over the tubs, flood the stalls, etc., but once you get them trained to it they jump right in and stay there. It probably feels good," he says.

Casner says that cold therapy fell out of favor a bit when medications came along. "Everyone thought phenylbutazone was the answer to



everything," he says. "There are times that we do use it as a tool but, like every other drug, it has side effects, and the list of side effects for phenylbutazone is long. Too many horsemen are convinced that drugs are the answer. If those riders would ice their horses before and after they perform, they'd run great and wouldn't have any of the adverse side effects like they might

have with drugs."

Rather than rely on medications, Casner says he never abandoned cooling therapy. "Cold therapy is a wonderful tool," he says. "We employ this method on our own horses for reducing swelling and inflammation; we use very little bute, and never use it more than two days in a row. We use cold therapy in training and as therapy after the horses run. There are no detrimental effects, like you'd have with drugs."

Casner, who also has experience with roping horses, encourages owners of all types of athletic horses to embrace icing and advises applying a bit of ingenuity when necessary to fit it into a busy competition schedule. "A person could probably figure out a way to use ice boots or cold water applications while they were rolling down the road hauling the horse to the next event," he says.



A bucket of water supplemented with ice will be cold enough for effective therapy, if you can convince the horse to stand in it. (You may hear advice to add rock salt to the mix to further lower the temperature of the ice bath, but that can make the mixture too cold, damaging tissues. Stick to straight ice and refresh it as necessary.) It may help to use a large muck bucket with a towel placed on the bottom to provide more secure footing for the horse. For the best results, try placing the horse's foot in the bucket, then fill it with water to just above the injured area, then add the ice.

If an ice bucket won't work for your horse, try a more "targeted" approach. "Some horses do better with commercial ice boots or cold-water soaking boots you can strap on the lower leg, since they can move around while wearing them," says Allen. "Boots with pockets you can put ice into are also handy and fairly comfortable for the

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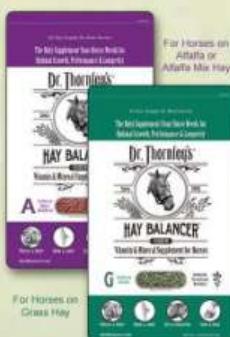


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horse. There is usually something between the ice and the horse's skin. The cold seeps through, but it doesn't give the horse such an initial cold shock like putting the foot into an ice slurry."

Cold packs can work, even if they are unconventional. "I have one client who keeps a bunch of bags of frozen cranberries in her freezer," says Allen. "Whenever she has a situation where a horse needs an ice pack, she just tapes these on. They stay frozen/cold for about 20 to 30 minutes, which is as long as you'd need an ice pack. Then she refreezes them for next time."

"Human athletes often take a frozen ice cup and massage the injured area," says Seabaugh. "It is certainly useful in humans, but it may be more difficult to obtain results in horses with their thicker muscles. Ice packs over a certain area that gets sore after performance might be useful, however."

If you'll be using cold therapy often or want to be more certain that you'll cool the target area enough, it might make sense to invest in one of the higher-tech systems for cooling limbs, such as saltwater "spas" and compression boots with continuously circulating fluids that cool the limb without getting it wet. "Many of the three-day event barns and some of the major training facilities have equipment like this to help with the recovery of equine athletes," says Seabaugh. Horses typically become acclimated to their use and will stand quietly for, and even appear to enjoy, regular treatments.

For better or worse, most of us are always ready to embrace innovative methods of caring for our horses. We aren't daunted by new or complex techniques so long as there is the promise that they will benefit our horses. Sometimes, however, simple is good. And cold therapy, when applied properly, is just that—a good, simple way to help keep horses sound, comfortable and healthy. 🐾



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CREATURE COMFORTS





By Karen
Elizabeth Baril



ast fall I fell into a fierce dispute over territory. It started innocently enough—a darting shadow along the floor of my barn aisle. A mouse? Maybe, but even though I caught only a glimpse of brown fur, it looked

too big to be a mouse. I set about doing a little detective work—inspecting both the inside and the outside of my barn's foundation for entry holes or rodent droppings. The more I looked, the more the evidence mounted.

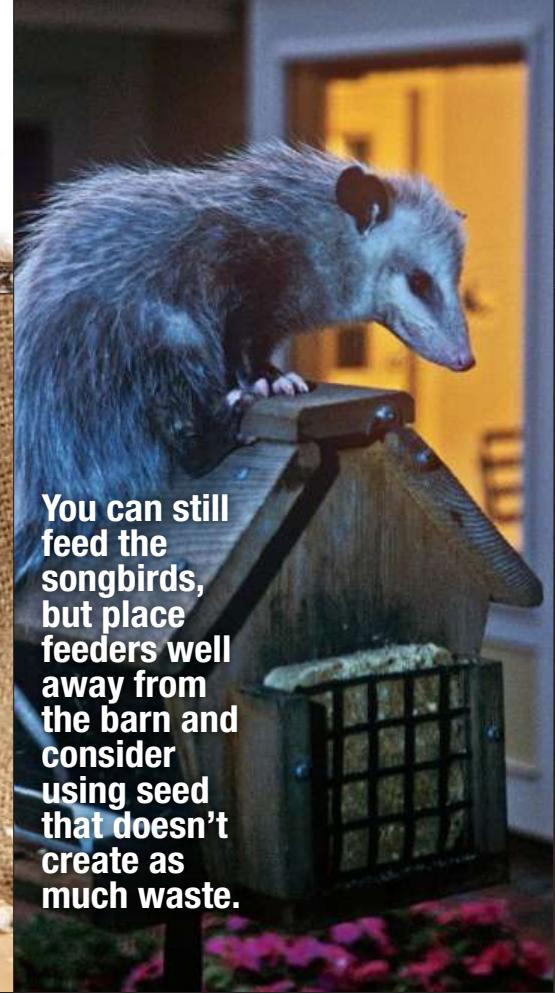
A colony of Norway rats, better known to horse owners as the "barn rat," had set up camp beneath my barn's dirt foundation. These rodents had not only established an elaborate series of cleverly hidden entry and exit holes, but they'd obviously been gnawing on one or two supporting barn timbers. I was familiar enough with rat behavior to know that they'd be most active after I shut off the lights for the night.

My skin crawled just thinking about it.

Aside from the structural damage rats inflict, they ruin feed, chew through electrical wires and spread salmonella, hantavirus and a host of other diseases. The typical female barn rat has four to six litters per year with breeding cycles peaking in the spring and fall.

This wasn't a dispute I could put off, even for a week or two.

Most of us have waged similar battles at some point over the years against all sorts of unwelcome visitors. The situation is often worse in the fall when animals like rats, mice, bees, venomous spiders and—believe it or not—some species of mosquitoes look for shelter from the harsher weather to come. Of



course, these animals aren't deliberately making your life difficult. They're just looking for a place to wait out the cold months.

"Animals just do what they need to do to survive," says Laura Simon, president of the Connecticut Wildlife Rehabilitators Association and wildlife ecologist with the Humane Society of the United States. "They survive by following their instincts, which means that many animals in the fall will search for a steady source of food and shelter. Horse barns are perfect environments for them, offering a supply of grain or pet food and lots of nooks and crannies to hide in."

For the most part, you probably don't mind sharing your farm with wildlife. In fact, it's part of the appeal of keeping horses—with one stipulation: They can't bunk in your barn. And as with so many things in life, it's much easier to bar entrance than to evict them later.

"That's why prevention is so important," says Simon. "Rather than wait

until we have a problem and then feel we have to pluck every last one of them from our horse's environment, we need to make our barns as unappealing as we can."

When devising your prevention strategy, says Simon, remember that the best way to change their behavior is to adjust yours. "We have to be diligent in making sure we don't offer wildlife a source of food and shelter in our barns. In many barns I've visited there's a bowl of food left out for the resident barn cat 24-7. That's like putting out a blinking neon buffet sign to wildlife."

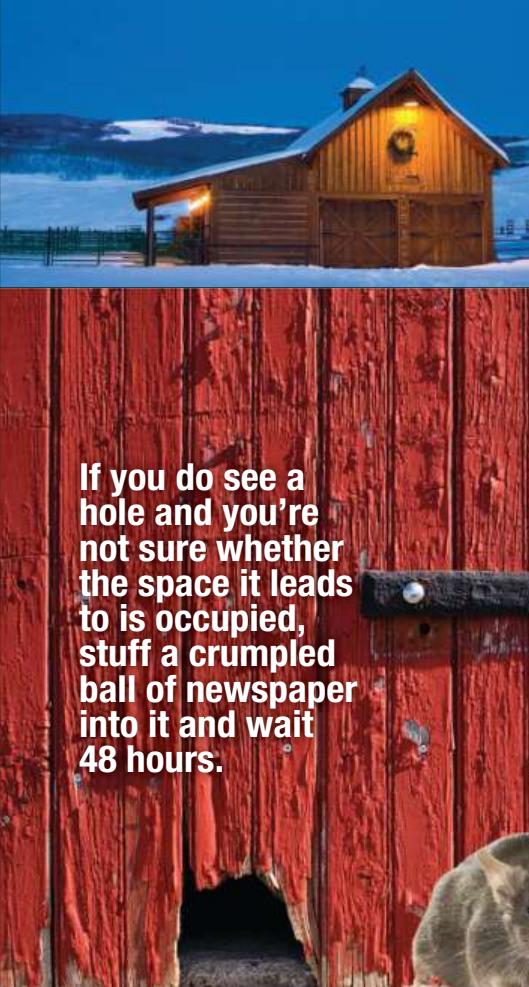
Simple measures, like keeping feed in metal containers and sweeping up bits of grain that fall on the floor, go a long way toward deterring animals from moving into your barn, but further action might be necessary depending on how determined the critters are in your neck of the woods. Whatever your situation, here's a three-step process for winter-proofing your barn that will get you started.

1. MAKE A .CLEAN SWEEP

A daily sweep of the barn, especially the feed room, is a good way to keep out rodents, raccoons and opossums—all of them love clutter and stray bits of feed. The trick to controlling wild animals is to control the food source. "If you have a barn cat," says Simon, "instead of leaving a bowl of food down all the time, try putting the bowl out once a day in the middle of the day. Cats are smart, and they'll adapt to this new schedule in no time."

Also tidy up your barn aisle and tack room. Animals, especially mice, love to hide and nest in old blankets, leg wraps and saddle pads that have been left on the floor.

As you organize your barn spaces, avoid placing items against the exterior walls. The spaces beneath or beside garbage bins and tarps, as well as within stacks of lumber, all make great nesting places for snakes,



If you do see a hole and you're not sure whether the space it leads to is occupied, stuff a crumpled ball of newspaper into it and wait 48 hours.



The average barn owl family consists of four to five chicks, and those chicks have enormous appetites, eating up to six or more rodents per night. A lot of success stories come from farmers, homeowners, orchards and stable owners who have installed owl nesting boxes.



rodents, spiders and carpenter ants.

Also be mindful of wildlife lures like bird feeders, suet cakes, vegetable compost heaps and open garbage bins. You can still feed the songbirds, but place feeders well away from the barn and consider using seed that doesn't create as much waste, such as sunflower kernels instead of sunflower seeds in the shell. Place bird feeders on poles with stovepipe baffles positioned at least four feet off the ground to deter squirrels and mice. Sweep up uneaten seeds that drop to the ground.

Mice love compost heaps, especially in winter, so place kitchen and manure composts well away from the barn and your home. Compost provides a relatively dry home, and if it's from the kitchen, a constant source of fresh food. Keep the compost damp and turn it frequently to discourage visitors from settling in. Elevated and fully contained barrels or tumblers work great for kitchen composts and rarely attract rodents.

2. BATTEN DOWN THE HATCHES

You can't seal off every opening, but patching any holes and crevices you find will reduce the opportunity for wildlife to enter your barn. Take an inventory of trouble spots, paying close attention to the foundation exterior, under siding or near the roof soffits. If you have a prefabricated building, make sure all gaps at joints are protected by metal flashing.

If you see signs of wildlife while doing your inventory, you'll want to find out if the creatures are still in residence before blocking entry. The last thing you want to do is barricade a colony of rats or other animals inside the barn. "If you do see a hole and you're not sure whether the space it leads to is occupied, stuff a crumpled ball of newspaper into the hole and wait 48 hours," advises Simon. "If the newspaper stays in place, the hole is probably unoccupied and it's safe to close it off."

Keep in mind that mice can squeeze through an opening smaller than the size of a penny. Seal off entry points with a quarter-inch woven/welded hardware cloth or caulk with a patching plaster. Pay special attention to plumbing. If you can see light, mice can probably gain entry. Caulk holes or pack them with a stainless steel/polyfiber product. Steel wool is sometimes used to fill in holes, but it will rust and stain your walls. One similar alternative is copper scouring pads, which are made of copper-coated wire.

Scrutinize your hay storage areas. "Hay sheds and lofts offer ideal hiding places for raccoons and opossums," says Simon. "Mice and rats may make homes under pallets. Even though it may seem like a lot of trouble initially, I recommend blocking entry to pallets by stapling galvanized hardware cloth all around the perimeter and across the top. You'll keep the ventilation you need, but it will go a long way to deterring wildlife from nesting under there."

ANOTHER SIDE TO OPOSSUMS



3. CONTROL POPULATIONS

If you follow Steps 1 and 2, you'll avoid most pest problems before they start. And that's a good thing. "We must be responsible when it comes to controlling wildlife conflicts," says Simon. "If we make our barns inhospitable, they'll find another place to spend the winter." But what if you already have a problem? Here are three common methods for ridding your barn of unwanted visitors:

Mechanical traps. If you already have mice or rats, you might be tempted to try trapping them, but be forewarned—it's a loathsome job. What's more, says Simon, it is generally futile: "The more you trap, the more animals you end up with. That's because if the source of the problem isn't removed [food or nest site attractants] then more animals from the surrounding area will replace any removed. The Humane Society of the United States does not consider trapping to be an effective method for resolving nuisance wildlife problems."

Glue traps are considered by most

Horse owners have an understandably rocky relationship with the opossum because of its role in the life cycle of the parasite that causes equine protozoal myeloencephalitis (EPM). But don't overlook the little marsupial's potential as a cleanup crew for ticks, carcasses and other undesirable elements on your property. Here are a few facts about opossums:

- A recent study by the Cary Institute of Ecosystem Studies in Millbrook, New York, showed that opossums are "tick magnets," which doesn't sound like a good thing but actually can be. That's because opossums are fastidious groomers, swallowing almost all of the ticks they host. And they snuffle up any ticks they find on the ground. The study indicated that in one season a single opossum

could eat as many as 5,000 ticks—earning him an important role in the fight against tick-borne Lyme disease.

- The opossum is the only marsupial (mammal with a pouch) in North America. The female opossum carries her young, which are born tiny and helpless, in her pouch until they're around 2 months old, after which they'll sometimes ride on her back.

- Opossums eat mostly carrion, nuts, berries and even rodents like mice and rats. They're known as the 24-7 cleanup crew. Opossums are nomadic, usually staying in one area for only a few days or so.

- According to the National Opossum Society, opossums tend to be immune from many diseases that commonly affect other mammals, and they are less susceptible to

rabies than are dogs, cats, cattle and other mammals.

- Opossums are not all that fierce. "In fact," says Laura Simon, president of the Connecticut Wildlife Rehabilitators Association and wildlife ecologist with the Humane Society of the United States, "they're rather shy. Photos usually show opossums looking fierce and baring their teeth, but it's all a bluff; they don't bite or attack. It's a primitive form of defense: They can't run fast or fight well so they have to rely on bluff and bluster. What they do is sway, hiss and drool to scare off a potential attacker but if that doesn't work, they play dead. How pathetic! I know they aren't considered all that cute. It's those long noses, tiny eyes, and little pointy teeth—but so what? As I tell people, we aren't all blessed with good looks."



Photos often show opossums looking fierce and baring their teeth, but it's all a bluff. They usually don't bite or attack.

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It's natural to focus on rodent, raccoon and bee problems as winter approaches, but mosquitoes are also a concern. "Depending on where you are in the country, mosquitoes can still be active in the fall," says Michael Waldvogel, extension associate professor with the North Carolina State University Department of Entomology.

Because mosquitoes see stagnant water as breeding grounds, Waldvogel suggests walking your property after a rainstorm to find places where water pools. Then, he says, look for ways to mitigate the

DON'T FORGET ABOUT MOSQUITOES

problem: "Is there anything you can do to improve drainage? Do you have objects lying around that collect water? It could be old cans, the bed of that pickup you plan to fix up some day, or a tarp covering a piece of equipment."

After you've identified areas where water collects, Waldvogel recommends doing a "Tip & Toss." "That's not a description of Saturday night in a bar," he assures, "but rather what we call 'source reduction.'

Fill or regrade areas that collect water. Flush out bird baths and check water troughs for signs of mosquitoes. If you can't completely empty something like a water trough and you still have mosquito activity—the larvae in the water—you can use something like 'Mosquito Dunks,' which contain bacteria that kill mosquito larvae (not the adults) and it is approved by the EPA for using in animal watering troughs."

Also keep in mind that,

under the right circumstances, some mosquitoes are remarkably resilient to winter cold. "Some species of mosquitoes spend the winter as adults hiding out in places that sufficiently protect them from extreme temperatures. That can include caves, animal burrows, even underground sewer systems," says Waldvogel. "Other mosquito species pass the winter as larvae in water even if the water freezes over, and others pass the winter as eggs, which are quite durable and can survive very dry conditions and even freezing temperatures (to a point)."

wildlife experts to be extremely inhumane because the stuck animal tries frantically to get away and can't, and it undergoes extreme stress, trauma, dehydration and physiological exhaustion

before succumbing to death by starvation. The nature of traps—even those deemed humane—underscores why prevention is the backbone of the best pest control programs. "Despite their bad

reputation," says Simon, "rats are highly intelligent creatures." They're smart and often very suspicious of anything new so they tend to not go into traps.

• **Chemicals.** Poisons or rodenticides



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are risky in the barn or farm setting. Rodenticides contain chemicals that act as anticoagulants, aggressively thinning the blood to the point of death. Toxic if inhaled or on contact, most anticoagulants are formulated as pellets or block baits that may prove appealing to cats, dogs or even horses. Because of that risk, never place baits in a horse's stall, and, no matter where they are used, enclose them in bait boxes (store-bought or homemade) that will keep out the curious (and hungry) cat, dog and random wildlife.

Another drawback of rodenticides is the risk of secondary poisoning.

"When beneficial predators like owls and hawks eat rodents that have ingested poison, they can become very weak and die," says Alex Godbe, director of The Hungry Owl Project in Marin County, California. "Secondary poisoning is devastating to raptor populations as well as other animals like coyotes, bobcats and mountain lions, all of which help to keep rodent

populations down. As their numbers decline, we only increase our pest problems." In addition, the killing of protected species is a violation of state and federal law.

• Integrated pest management.

IPM is a system of control that incorporates prevention and environmentally friendly control to keep wildlife out of structures or from damaging crops.

Vineyard owners in California, Oregon and Washington State have been using barn owls for rodent control for decades. Horse owners can use similar strategies by installing barn owl nesting boxes facing outward, away from the barn, to discourage owls from entering. While research shows that owls can transmit salmonella through their feces, the advantage of their presence far outweighs the risk. In fact, according to Godbe, it's a proven, safe and highly effective method of keeping rodent populations down. "The average barn owl family consists of four to five chicks, and

those chicks have enormous appetites, eating up to six or more rodents per night. We have a lot of success stories from farmers, homeowners, orchards and stable owners who have installed owl nesting boxes." For information on height, placement, and best locations for nesting boxes, visit The Hungry Owl Project at www.hungryowl.org.

The onset of cold weather is a powerful motivation for mice and other pests to seek safe shelter. "Animals will search for food and shelter in the fall," says Simon, "but if you follow a good prevention program, they'll look elsewhere for shelter—and stay out of your barn." ●

About the author: Karen Elizabeth Baril writes from her home base, Pen-y-Bryn Farm in the northwest hills of Connecticut. Current residents include five horses, two dogs, a husband with a sense of humor, a chicken or two, and whatever critters might trundle through in the night.

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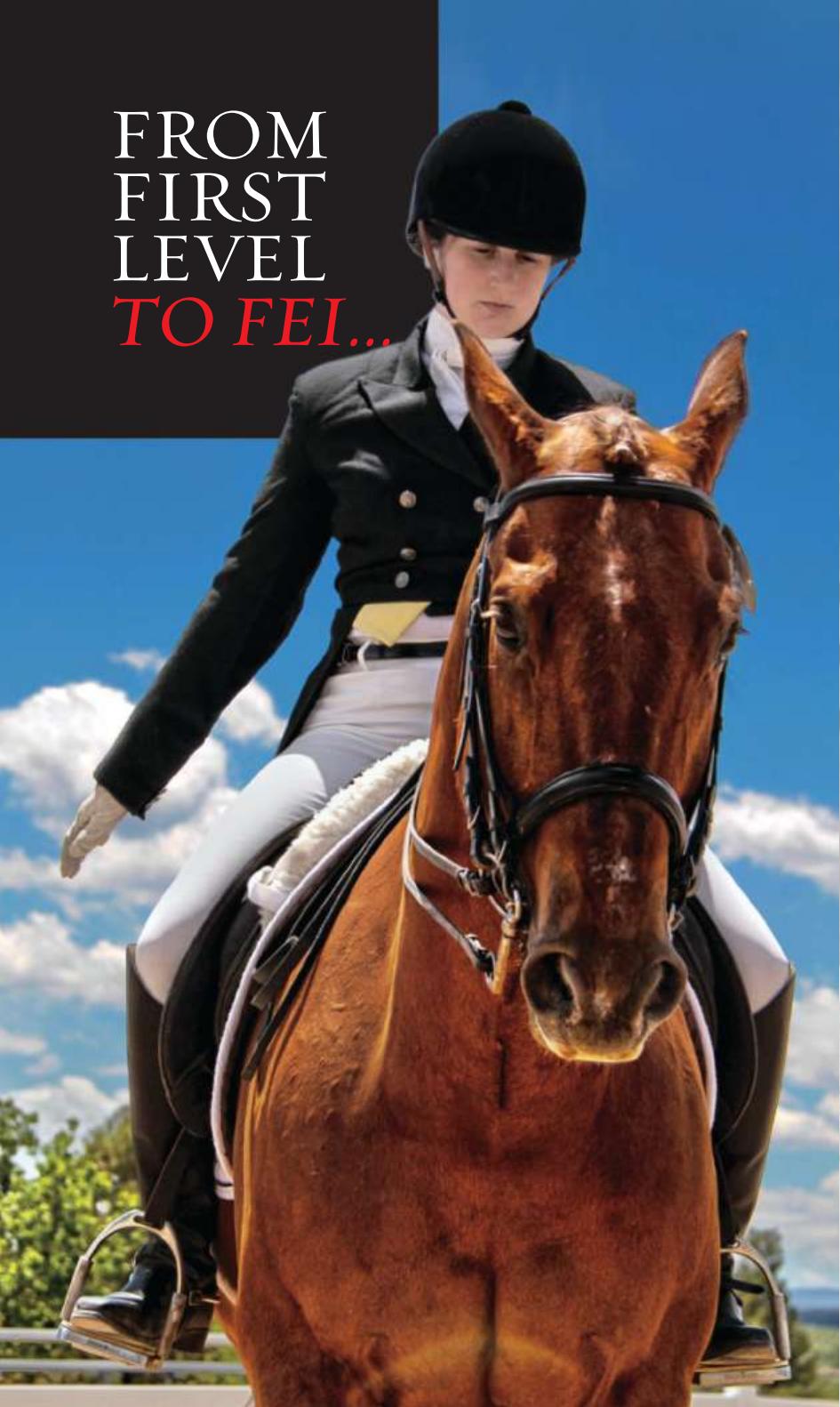
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On watch for dog flu



Two strains of canine influenza are causing outbreaks across the country. But you can take steps to protect your dog.



By Laurie
Bonner

Canine influenza, also called "dog flu," has been making the news on and off for the past year or so. A new strain, imported from Asia earlier this year, has sickened thousands of dogs in the United States, and as outbreaks have spread from state to state, some of the local headlines have sounded dire, with terms such as "deadly," "contagious" and "epidemic."

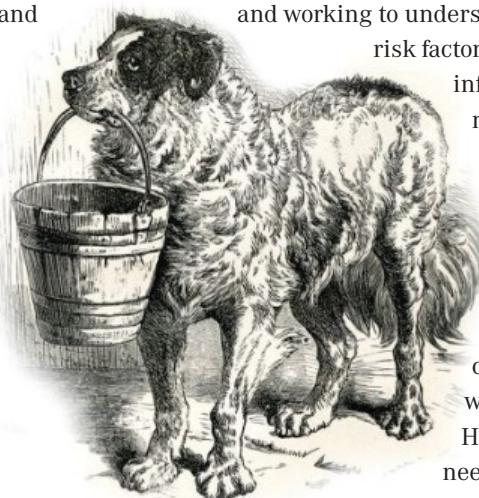
So when you hear your dog starting to cough one night, naturally, you're worried. Ordinarily, when one of your animals seems a little sluggish, you'd "wait and see" for a day or two before calling the veterinarian. But is this a time to rush your dog to the emergency clinic?

Not necessarily—at least it's not an emergency. Even if your dog has contracted influenza, chances are he will be just fine. Still, it

is a good idea to get him to a veterinarian sooner rather than later.

"The golden rule, if you are seeing a respiratory illness in your dog, is that he ought to be seen by a veterinarian and maybe be treated with an antibiotic before it gets worse," says virologist Edward Dubovi, PhD, of Cornell University. "Mortality is not great as a result of the virus, but the difficulty with respiratory infection in dogs isn't with the initial viral infection; it can be complicated by secondary bacterial infections that, once entrenched, can be difficult to treat."

Researchers are still gathering data and working to understand all of the risk factors for canine influenza. In the meantime, your best bet for protecting your dog is limiting his exposure to situations where he might come into contact with the virus. Here's what you need to know.



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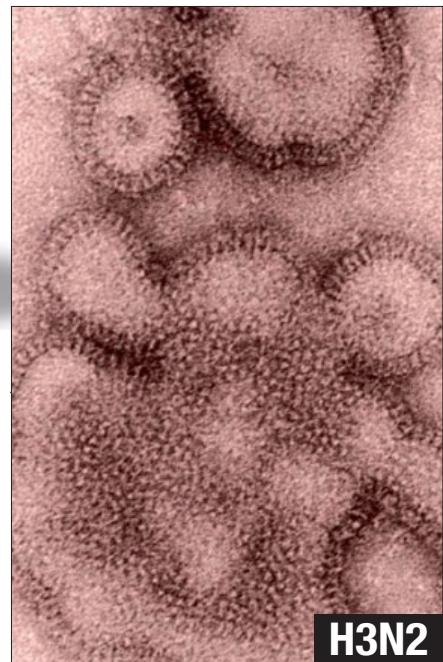
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First detected in January 2004 among racing greyhounds in South Florida, H3N8 had caused outbreaks at 20 tracks in 11 states by spring of 2005.



H3N2

Michigan, New Jersey, Iowa and Indiana. How the virus reached the United States is not known.

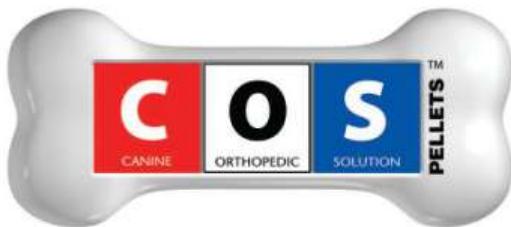
Both strains of influenza pass readily from dog to dog via nasal secretions. This can happen through direct nose-to-nose contact, by way of airborne secretions and through contact with shared objects, such as food and water bowls



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and kennel surfaces. People can also transfer the virus between dogs on their skin and clothes. According to the American Veterinary Medical Association (AVMA), flu virus can survive on surfaces for 48 hours, on clothing for 24 hours and on hands for 12

hours. It spreads most readily among dogs kept in close quarters, such as kennels, shelters, daycare centers and boarding facilities.

Neither H3N2 nor H3N8 causes illness in people, but horse owners ought to be aware of the possibility of one type of cross-species infection:

The strain of H3N8 that causes equine influenza may also infect dogs. "So if your horse sneezes on your friendly dog, the dog can get ill," Dubovi says. "But that strain of the virus doesn't transfer on to other dogs. And the canine H3N8 does not go from dogs back to horses."

H3N2 is not known to affect horses, but it can cause respiratory illness in cats. "If

Flu spreads readily among dogs kept in close quarters, such as kennels, shelters and boarding facilities.

you have dogs and cats in your home, and your dog gets sick, it could spread to your cats," says Dubovi.

THE ILLNESS

When a dog is exposed to canine influenza, the infection incubates for two to four days before signs

of illness appear. During this time, he will shed large amounts of the virus—in other words, dogs may be contagious before they get sick. They may continue shedding the virus for up to three weeks after infection.

The viruses cause inflammation of the lining of the respiratory tract,

potentially from the dog's nose all the way to the bronchioles in the



The same strain that causes equine flu may also infect dogs. "So if your horse sneezes on your friendly dog, the dog can get ill," says Edward Dubovi, PhD.



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lungs. The severity of influenza varies, depending on the dog:

- The majority (more than 70 percent) develop a mild illness.

According to the AVMA, the primary sign is a persistent cough that lasts for 10 to 21 days. Other signs include nasal discharge, sneezing, lethargy, loss of appetite and a low-grade fever.

• A small number of dogs (maybe 3 to 5 percent) will develop a more severe form of illness, including a high fever (104 to 106 degrees), labored breathing and pneumonia, according to the AVMA. Some cases may be fatal.

• A significant number (20 to 25 percent) of dogs will become infected with the virus but will never show any outward signs of illness. Still, they are able to pass the virus to others.

All of these percentages, including the mortality rate, are approximations—researchers don't have all the data they need. "In Chicago, we think 3,000 to 5,000 dogs were exposed, with only six dying, but we really don't know for sure," says Dubovi. "We've had no centralized data collection."

It's also not clear whether some dogs might be more susceptible than

others. "We have no data to suggest age or breed differences," says Dubovi.

"There may be some out there, but we don't have enough data to draw any conclusions, so it's best to assume all dogs may be susceptible."

Because the clinical signs of canine influenza are similar to other respiratory diseases, a definitive diagnosis requires clinical testing. Within the first week of exposure, before the dog has built up antibodies to the virus in his blood, the most effective diagnostic test is to analyze nasal swabs via polymerase chain reaction (PCR) to identify the presence of the virus. After that, blood tests—to look for antibodies in the dog's serum

—become the more accurate method.

The only treatment for canine influenza is supportive care. Nonsteroidal anti-inflammatory medications may be used to alleviate fever and inflammation, and IV fluids may be necessary to prevent dehydration.



Antibiotic medications may be prescribed if the dog has developed secondary bacterial infections. According to the AVMA, most dogs recover within two to three weeks.

S.T. DADD

PREVENTIVE MEASURES

Two vaccines are available to protect dogs against H3N8; there is currently no vaccine available for H3N2. However, Dubovi expects there will eventually be one: "Rumors are that the biologics companies are working on a vaccine. They ought to be able to come out with a multivalent vaccine [which combines both viruses into one formula] with fewer regulatory hurdles than it would take to create a whole new one." It is not known whether the H3N8 vaccine will also protect a dog against infection with H3N2.

The dogs most at risk of encountering canine influenza viruses are those who congregate in large numbers in confined spaces, such as at kennels, shelters, daycare facilities, dog parks and similar venues. Rural dogs on the whole may be less at risk of exposure, but contagion is still possible—for

If you've heard that canine influenza outbreaks are occurring in your area, ask questions before bringing your dog into contact with others.



example, if you regularly take your dog to a boarding barn and he socializes with dogs there, some of whom might also frequent dog parks.

If you've heard that canine influenza outbreaks are in your area, exercise caution and ask questions before bringing your dog into contact with others. "If 100 dogs are congregating in one place, and 70 of them come down with a respiratory illness, chances are it's influenza," says Dubovi. "The only safe bet is to keep your dog away from other dogs." ●

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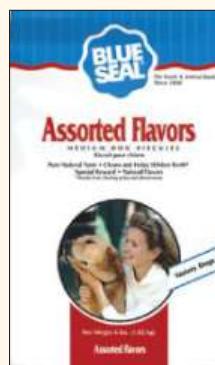


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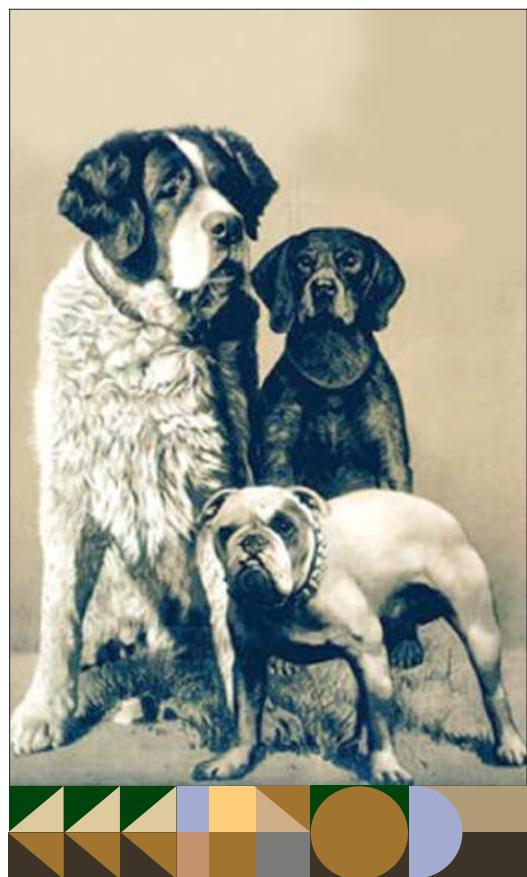
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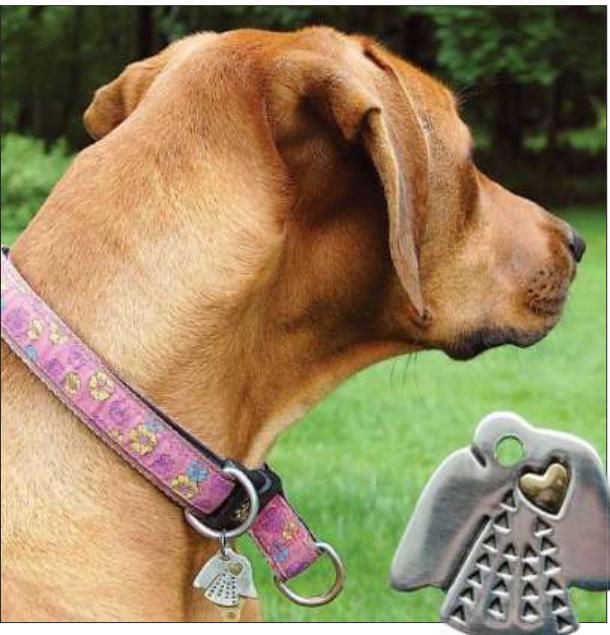
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Dancing with Spirit

During a fall elk-hunting trip in New Mexico, I came to realize just how much I missed horses. The hours we spent riding through the Jemez Mountains rekindled an old love—one ignited by my first horse, a gift I received more than a half century earlier on my 8th birthday. Time on horseback always provided me a sense of freedom and independence, a view of the world that could not be found any other place.

But now we lived off-the-grid, in a log cabin tucked away in the spruce and hardwood forest of Michigan's Upper Peninsula. And I was well north of 60 years old. So owning a horse again seemed not only highly improbable but also impractical—we had no cleared land, no barn and no known source of hay.

Yet, on the spectacular October day when I reluctantly handed off the reins of my borrowed horse, the guide looked at my husband, nodded knowingly in my direction, and said, "She'll have a horse by spring."

Not quite. But on a sweltering afternoon the following July a red trailer carrying a silver grulla gelding named Blues Tiger Doc arrived in our driveway. Tiger stripes wrapped his muscular hindquarters, dapples dotted his hips and silver highlights dusted his black mane. What were his thoughts as he peered between the thin slats

My plucky gelding might not seem like the ideal choice for an aging rider, but he is perfect for me.

By Chris Kent



of the stock trailer at my husband, our German Shorthaired Pointer, Kaiser, and me? What did he think about the towering aspen and spruce that formed a wall around the small barn and newly cleared paddock?

When the gate of the stock trailer swung open, the gelding cautiously backed out. His ebony eyes were flashing, his silver-tipped ears in constant motion and his nostrils flared as he issued a snort. Every inch of his 16 hands expressed nervous energy as he danced

at the end of the lead rope. My confidence about riding this horse into my 70s began to falter.

In the weeks that followed, the boundaries of our relationship were tested. Tigger, the nickname given by his previous owners, just didn't fit this splendid animal, so he became Spirit. A friend suggested I might have chosen a name like Smokey or Spot, something more befitting a "senior" rider's horse. But Spirit lived up to his wilder name. He would brace his feet, refusing to enter his stall; the stark white at the edges of his black eyes evidence of his fear. He didn't understand how the wolves living in the surrounding forest might find him delectable if he

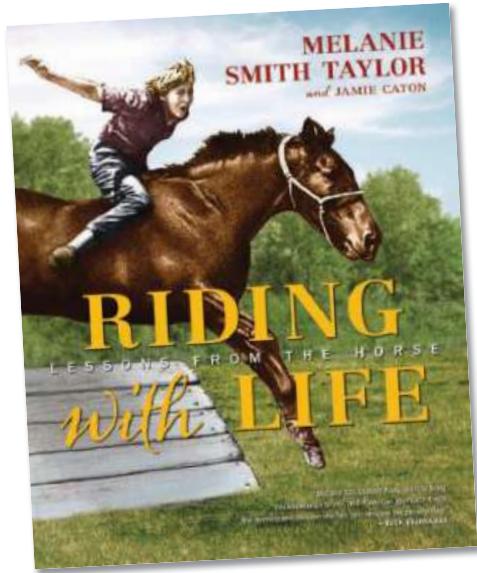
stayed in the paddock at night.

On a trail ride through the woods, Spirit suddenly bolted, throwing me back across those dappled hips, giving me a view I don't recommend for riders: the toes of my worn leather boots set against blue sky and aspen treetops. Miraculously, I stayed on, and as I struggled to right myself in the saddle, I heard my husband's voice, "Are you alright?"

"I'm OK. Just give me a minute," I said as I took stock of my condition. Everything seemed to be working; nothing hurt that much. As Spirit danced sideways on the narrow trail, head high, ears nervously moving I stroked his



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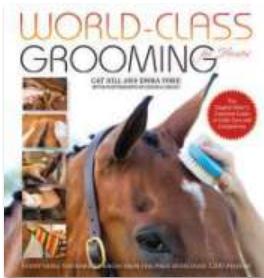
Riding with Life: Lessons from the Horse

by Melanie Smith Taylor and Jamie Caton

In this comprehensive training guide, renowned Olympic gold medalist Melanie Smith Taylor shares her unique program for setting horse and rider up for success. Blending her in-depth knowledge of groundwork and flatwork with her vast experience in the hunter/jumper discipline, she explains how to achieve a harmonious partnership with your horse and realize his full potential—whether you're a weekend trail rider or serious competitor.

Against the backdrop of her life story, Melanie presents a wealth of specific exercises, instructional photographs and valuable advice, as well as details about the many horses that have helped shape her approach. Throughout *Riding with Life*, she encourages us to appreciate and honor the nobility of the horse and forge a true connection with this majestic animal.

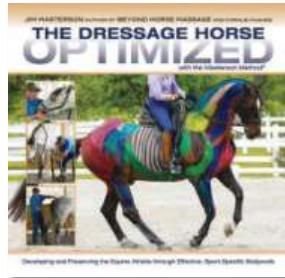
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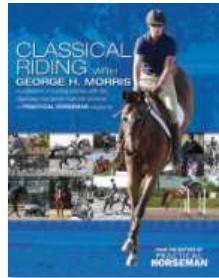
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neck trying to calm him and myself.

This was the first of many countless hours Spirit and I would spend in a constant series of "dance lessons."

I have learned a lot from these pirouettes, including an increased awareness and appreciation for the intelligence, curiosity and affection of this animal. I have also learned patience and perseverance as we have danced together.

Spirit, too, has been learning—to trust me and to better understand what I am asking. I found a round pen to be a very effective environment for him. It allowed us to establish leadership, respect and communication. I was able to control his direction and movement in a relaxed environment. He quickly turned his inside ear toward me, began licking his lips and soon was watching me for cues.

Providing Spirit the freedom to make choices allowed him to comfortably invite me into his world, to his dance. Together, we have waltzed, done

However, he has taught me a more important lesson: A moment of complacency at any age on any horse is the prescription for disaster.

Conversely, Spirit has also taught me the value of a new challenge in this period of my life. I have accepted the need to use a mounting step to climb on his back. I know my old mind must be alert every moment I spend with him. I understand the need to exercise additional caution to protect my brittle bones. In spite of all this, I plan to exhaust the coming years learning more every day about my horse.

On my 70th birthday my husband asked, "How do you want to celebrate?"

My response came easily. No thanks to dinner at a fancy restaurant, a diamond ring or something new for the house. Instead, "I want to spend this spectacular autumn day on my horse in the woods with you and your horse."

And so we did. A canopy of blazing

gold and crimson leaves clung to the trees overhead while a matching carpet blanketed the earth

the two-step, sometimes a fox trot, or even a mambo, but finally my partner has agreed to let me lead.

Hours on the trails have calmed Spirit's initial fears of the constant flutter of grouse and the startling rustle of deer bounding through the brush. There are still days that we dance, when we test each other with a new step. However, every morning he greets me with a long whinny when I open the back door, and each evening he calls to me from the gate to remind me he wants a few minutes of my attention.

I know we will have our future setbacks. He will never be the steady Eddy an old lady should be riding.

Spirit has taught me the value of a new challenge in this period of my life. I have accepted the need to use a mounting step to climb on his back. I know my old mind must be alert every moment I spend with him.

under the horses' feet. Leaves created a cacophony of sound as hooves moved rhythmically along the trail. The sky was a brilliant dazzling sapphire with just an occasional wisp of silken clouds propelled airily by a gentle breeze.

After several hours of riding we stopped along the river for a respite. Spirit hung his head over my shoulder as I rested on a downed log, his chin in my lap, his black ebony eye next to my face, offering a glimpse into his soul. There was a harmony that day between us, an esprit de corps we had not experienced before. And so began my ride into the next decade on the back of this remarkable being—my Spirit. ●

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DERMATOLOGY

Preventing urine scald

Q My boy Daryl has a nasty case of scald on the front of both hind cannon bones.

The veterinarian says it is because he splatters his legs when he stakes, and he gave me a shampoo that didn't do much good. What else can I do?

Lynn Howland
Maple Valley, Washington

A How great to hear someone use the term "stakes." It brings back memories of the great horsemen of my youth! For those not familiar with the word, it means "urinate."

Healthy adult horses don't often get urine scald—irritation and scabbing caused when urine splashes onto the skin. If Daryl's skin problem is truly scald, the first step is to rule out a urinary disorder as well as possibly a physical issue that prevents him from stretching out fully when he urinates. But given that you've already spoken to your veterinarian about this problem, I am going to assume your horse was examined and he is OK.

Next, I would wonder about his bedding. Urine is more likely to splash farther when it falls onto harder ground. If you can give him deeper bedding in his stall, so that the urine no longer splashes onto his skin, he should heal quickly. I know this may be harder than it sounds, especially if you are boarding or if he avoids stalling in his stall.

If that doesn't work, the next step is to apply a protectant to the skin that is getting splashed. Petroleum jelly or zinc oxide ointment (diaper rash medicine) forms a coating that protects the skin and encourages healing. Gently



FRANK SORGE/ARND BRONKHORST PHOTOGRAPHY

ALL CLEAR: If a horse is able to stretch normally, he is unlikely to develop scald—irritation and scabbing that can occur when urine splashes on the skin.

clean and dry the affected areas, and then keep a thick layer of ointment in place at all times. You should see improvement in two to three weeks. If Daryl is in an environment where he is going to continue splashing on himself, you may need to keep applying the ointment indefinitely.

If Daryl's skin worsens or does not improve with treatment over the course of a month or so, it may be time to call your veterinarian back out. Many skin problems can look alike, so it is easy to misdiagnose something on a first visit. A second examination, perhaps with a biopsy or other diagnostic tests, may be needed.

For example, cannon keratosis, a form of oily seborrhea⁰, can easily be mistaken for urine scald. This thick, greasy dermatitis is more common in geldings and stallions, but it sometimes happens in mares, and it can be really pesky to wipe out. In this case, you need the prescription shampoo from your veterinarian, or a Betadine scrub, to break up the greasy coating and kill

the bacteria underneath. This takes a long time to get under control, but it is not really painful or harmful in most horses. The key is to be persistent and gentle so that you don't damage the skin as you treat the greasy crusts.

Good luck with caring for Daryl's skin. It can be a challenge to get to the bottom of this kind of problem, but some perseverance in treatment can do a lot of good!

Melinda Freckleton, DVM
Haymarket Veterinary Service
Gainesville, Virginia

THIS MONTH'S EXPERT



Melinda Freckleton, DVM, is a veterinarian at Haymarket Veterinary Service in Gainesville, Virginia. A graduate of Cornell University's College of Veterinary Medicine, Freckleton enjoys riding and competing in dressage and taking care of her dogs, cats and horses on her small farm.

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EQ GLOSSARY

allele—one of the alternative forms of any gene on a chromosome. Each allele represents a different variation of a physical trait and each has one corresponding allele on the chromosome's paired counterpart. For example, one blue-eye allele will have one corresponding allele that carries either a blue, green or brown-eye trait.

anemia—shortage of red blood cells, commonly caused by excessive bleeding, infection, dietary deficiency or presence of toxins in the body.

body condition score (BCS)—a designation, based on a nine-point numeric scale, indicating the amount of fat on a horse's body. A BCS is assigned after a visual and hands-on appraisal.

chromosome—the self-replicating genetic structure of cells containing the cellular DNA that bears in its nucleotide sequence the linear array of genes. Each species has a constant number of chromosomes set in pairs in the nucleus of each body cell; the horse has 64, or 32 pairs.

dominant—pertaining to a gene that guarantees the appearance of its trait in the offspring, regardless of the nature of the gene with which it is paired.

equine metabolic syndrome—endocrine disorder characterized by increased fat deposits in specific locations of the body or overall obesity; insulin resistance, which leads to abnor-

mally high levels of the hormone circulating in the bloodstream; and a predisposition toward laminitis in the absence of other recognized causes.

equine protozoal myeloencephalitis (EPM)—inflammation of the brain and spinal cord caused by protozoal infection.

insulin resistance—metabolic disorder, similar to type-2 diabetes, that occurs when certain cells in the body become less sensitive to the action of insulin, and normal amounts of the hormone can no longer keep adequate amounts of glucose moving into the cells for use as fuel.

laminitis—inflammation of the sensitive plates of soft tissue (laminae) within the horse's foot caused by physical or physiologic injury. Severe cases of laminitis may result in founder, an internal deformity of the foot. *Acute* laminitis sets in rapidly and usually responds to appropriate, intensive treatment, while *chronic* laminitis is a persistent, long-term condition that may be unresponsive to treatment.

Lyme disease—potentially debilitating and even fatal bacterial infection spread by deer ticks (*Ixodes dammini*), affecting people and domestic animals, including horses. Signs of infection in horses include lethargy, fever, swollen joints, shifting leg lameness, laminitis, ocular inflammation and hypersensitivity of the skin and underlying muscle.

pituitary pars intermedia dysfunction (PPID, Cushing's disease)—disease caused when the cortex of the adrenal gland produces excessive amounts of hormones, including

cortisol; signs include persistent long hair, thin skin, fragile bones, stupor, weakness and sweating.

proud flesh—excess granulation tissue rising out of and above the edges of a wound, forming a raw, exposed mound that makes further healing delayed or impossible without medication or surgery.

recessive trait—genetic trait that appears only when both of its corresponding alleles are identical and in the absence of its dominant counterpart allele. For example, the recessive trait of blue eyes will appear in persons only if both parents pass on blue-eye genes. Otherwise, a dominant brown-eye gene will subordinate the blue-eye and the offspring will be brown-eyed.

seborrhea—skin condition resulting from malfunction of the oil-forming (sebaceous) glands; can be characterized by dry, waxy or excessively oily accumulations on the skin.

white cells (leukocytes, white blood cells)—colorless blood cells active in the body's defense against infection or other assault. There are five types: neutrophils, lymphocytes, eosinophils, monocytes and basophils.

white line—zone on the bottom of the horse's hoof where the insensitive laminae and the interlaminar horn attach the wall to the margin of the sole.

white line disease—bacterial and/or fungal infection of the stratum medium, the middle layer of the hoof wall; characterized by a widened, depressed area with a powdery texture along the white line, where the hoof wall meets the sole. ●

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The right horse at the right time

It is late evening and I am sitting on an upturned bucket in the barn. My mare is in cross ties, looming patiently over me as I clip her legs. I am not doing a respectable job. Hair, my own or my horse's, remains one of life's great mysteries to me. Even when I was clipping regularly, I could not produce a decent job. Now I am tired. I have just completed a fast-paced week in my job as a high school teacher, and I am preparing for my first horse show in five years. I still have to ride. I still have to clean tack. I am not ready and neither is my mare, but horse show world, here we come.

Recently, I have started pushing the edges of my comfort zone in more than one area of my life. And I have gained a new friend, nearly 20 years younger than myself, who has been encouraging me to get back into the show ring. I had competed in a variety of English and Western classes since I was 12, and I don't remember why I left it; I always enjoyed my experiences. Sometimes, life just happens. I no longer possess a bottomless well of energy.

This reflection leads me back to thoughts of my mare—she represents one "comfort zone" I will not stretch. I am honest enough with myself to recognize that sometimes we are given the perfect horse for the season in our lives. Sally is that horse for me. She would not be considered a fancy mover, but she is consistent and for the most part motors me safely around



My mare isn't the flashiest mover, but she's the perfect horse for me at this stage of my life.

By Hope Ellis-Ashburn

the arena or over a course of fences.

I appreciate her sameness regardless of the amount of time that has passed between rides. When she and I were both younger, she safely carried my daughter around the arena in walk-trot poles classes; I do not believe that she would ever have considered doing otherwise. Nowadays, she would much prefer to go out on the trails but will patiently consider my other requests. It is beyond me now how I once thought I needed a sportier model. I am much

happier with a sedan, if you will, rather than a sports car.

This weekend, I am amazed by the fact that, although Sally hasn't been on a trailer, been bathed or had anything except her bridle path clipped in five years, she willingly allows me to do all of these things. We have been together nine years

WELL-MATCHED: The author with her Half-Arabian mare, *Aallusive Angel*, also known as "Sally."

now. We know each other's moods and habits, strengths and weaknesses. We have formed a bond.

The show is a success, although my definition of this word is vastly different than it once was: I am simply pleased that I didn't fall off. The end of the day finds me exhausted but happy. Although Sally and I were both out of practice and did not perform our best, her behavior was exemplary until the last class. She was tired, her patience with me stretched to its limits. So she managed to work in a couple of crow hops during canter departs in both directions—a bit of naughtiness that provided the entertainment of the day for the small, family-oriented show.

Even this was perfect, serving to remind me that, yes, I can still handle these small mishaps. Horses are wonderful teachers and companions in our lives, and I am thankful to have Sally in mine, not only in this season but for those to come. ♦

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